The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XXII. No. 557 MARCH 1, 1930 Prepaid Annual Subscription: United Kingdom, £1.1.0; Abroad, £1.6.0

Contents

PAGE

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is* 21s. *per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders, and Postal Orders should be made payable to Benn Brothers, Ltd.*

Benn Brothers, Ltd., proprietors of THE CHEMICAL AGE, *have for some years past adopted the five-day week, and the editorial and general offices (Bouverie House, 154, Fleet Street, London, E.C.4), are closed on Saturdays.*

Telegrams: "Allangas, Fleet, London." Telephone: City 0244

Afterthoughts on the Fair

Now that the British Industries Fair of 1930 is over, the usual reflections on the results are coming in. These are not widely different from those of past years, but they may briefly be noted. Generally speaking, the idea of an annual business fair is now widely accepted. The number of both the exhibitors and of the buying or sight-seeing visitors sufficiently demonstrates the fact. As a widespread piece of advertisement its effect is undoubtedly stimulating, and if it were discontinued—of which, let us make it clear, no hint has been suggested—the absence of an annual rallying point would clearly be missed. The Fair of 1930 may in general terms be said to have fully justified itself, and its results, though these can never be completely tabulated, are bound to be beneficial to national industry.

As to the chemical section a natural observation—one, in fact, made by "A Buyer" in this issue—is that it largely repeated the familiar features of previous exhibitions. This, however, is inevitable. The products of British chemical industry are mainly the same year after year, and only now and again is there any new thing out of the laboratory or out of the works that would warrant much shouting. Nor are the products of chemical industry spectacular. Their virtues lie, not in their appeal to the eye, but in their purity and their consistency of quality. Even an artist could hardly make a picture of insulin; the finest pea crystal or needle crystal of neutral sulphate of ammonia, whether by-product or synthetic, does not call aloud upon public attention; the purest oil from coal, except to the chemist who knows the processes by which it has been obtained, looks like any other sample of oil.

What can be done to celebrate such achievements? Nothing very much beyond making their existence known to those who need them, and that simply means efficient advertisement or publicity. That the Fair serves this purpose among home and overseas buyers there can be no doubt. It did not do it either last year or this on the magnificent scale of Wembley, and the criticism is justified that, owing to its location, the chemical section did not arrest attention in the highest degree. It did not seek out the buyers; it had to be sought out by them. And we do not quite see how, apart from a greatly increased expenditure, it could be otherwise. On the whole the chemical section was fairly representative, it was decently staged and organised, and the exhibitors will hope and feel that it has been well worth while. A portion, at least, of the bread cast upon the waters will certainly be recovered.

Signposts in Chemical Industry

THE address by Dr. E. F. Armstrong on "Signposts in Chemical Industry," reproduced in this issue, is an utterance of more than usual interest. It presents, in a very condensed space, a spacious chapter of modern industrial chemistry, more fruitful in its technical and commercial results than probably any other corresponding period; it presents it in a sort of detached spirit, free from exaggeration, yet with imagination and with an exact appreciation of what these chemical triumphs really amount to. This excursion along what Dr. Armstrong picturesquely calls the "Via Catalytica" becomes a very cheerful journey past milestone after milestone of brilliant achievement. It is well to have minds capable of seeing and presenting to the present generation some of the great things that have hardly yet had time to settle into their proper historical setting.

Meredith's fine lines with which the address opens are well used to express the spirit in which the true chemist works. Future progress, like that of the past, will be due to the process of "digging about the roots," of inquiry into what is fundamental. Such work is, from its nature, unknown to the public, and only when it results in the production of materials of direct value to the public does it command recognition. In the meantime chemists need not further obscure their activities by the undue use of a "specialised nomen-

clature " that means nothing to the average industrialist; he has everything to gain by making his message intelligible to the non-technical mind. This, we fear, is a gift denied to many and not cultivated by still more. Our own observation generally is that the real master of a difficult subject can make it—or perhaps, one should say, can afford to make it—look quite simple; lesser lights, if they talked in simple terms, would be fearful that their great learning might escape observation. If Dr. Armstrong's address, by precept and example, commends that idea to the younger chemists, it will be a service for which later they will thank him.

The Presidency of the Institute

PROFESSOR ARTHUR SMITHELLS, when he retires on March 3 from the presidency of the Institute of Chemistry, after having completed the full term of three years in office, will have the satisfaction of looking back on a happy and prosperous period of service. During his tenure, to quote the official words, " the influence of the Institute and its usefulness to the Fellows and Associates have been further enhanced and the roll of membership has increased by over 500 members—denoting substantial progress in the organisation of the profession of chemistry." In these circumstances it is but natural that the Council should put on record its sincere appreciation of his services, of his courtesy and ability in the guidance of its affairs, and of the admirable manner in which he presided over the jubilee celebrations in 1927.

The Institute may be equally congratulated on the choice as his successor of Dr. G. C. Clayton, who is at present travelling abroad, but is expected home in April. Dr. Clayton has been a member of the Institute for nearly forty years, and has already served it in many important capacities. Becoming an associate in 1890, he has gone through the varied experiences of research chemist, member of Parliament, director of the United Alkali Co., and later of Imperial Chemical Industries, and member of the Advisory Council of the Department of Scientific and Industrial Research. He will bring to the high office of president the qualities of courtesy, efficiency, service, and quiet distinction that the Institute itself so constantly represents.

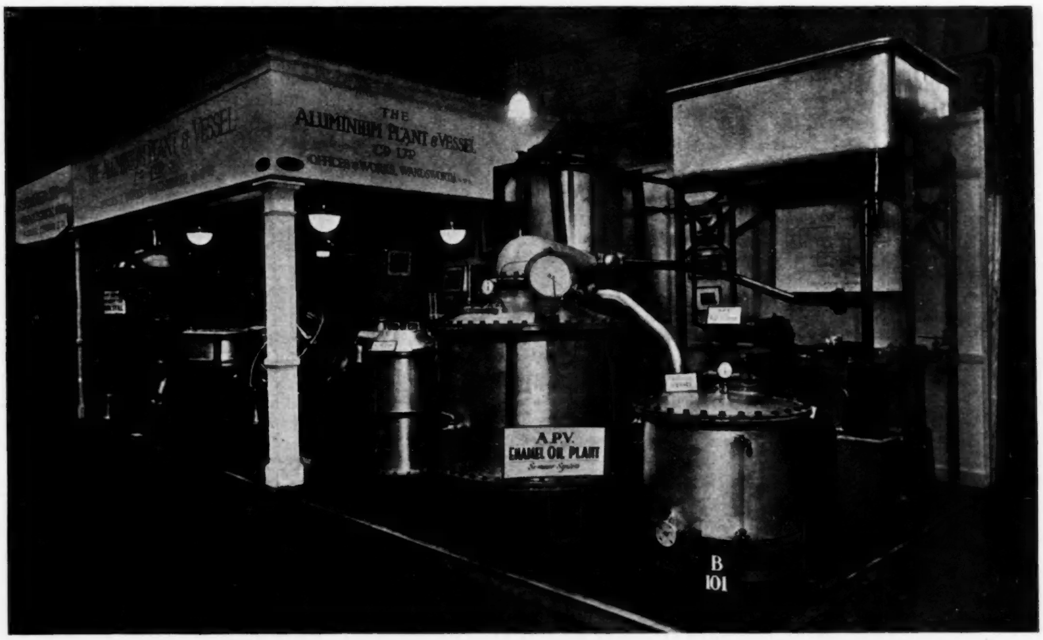
The I.C.I. Position

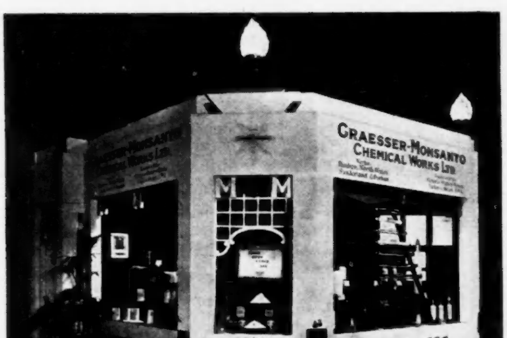
THE board of Imperial Chemical Industries have done once more the right thing in promptly correcting the erroneous and damaging rumours that appear to be floating about. Exactly how these arise or where they emanate from it is not easy to determine, but at present it is no act of friendliness to British industry to start doubts which as soon as they are expressed can be described with authority as lacking foundation. According to an official announcement, there is no truth in the suggestion that Imperial Chemical Industries contemplate a further issue of capital, their resources being ample for the company's needs, while their earnings, even in a period when the trades it supplies are not at their best, are in excess of those of any previous period. These assurances should bring satisfaction to shareholders, who have seen the market value of their shares on the decline for some time past, and may have been quite unable to discover a reason. All the authorised references to the company's activities at home and abroad express satisfaction with the position, in spite of the unsettling financial factors that have arisen both in this country and in the United States, and at the third annual meeting to be shortly held one may look for a statement from the chairman of as satisfactory and promising a character as those on the previous two occasions. In the chemical industry itself it will be recognised that the public reputation of so large a concern is of immense importance to chemical industry and indeed to British industry as a whole, and for that, if for no other reason, the promptest dispersion of such rumours as those referred to is a service of value.

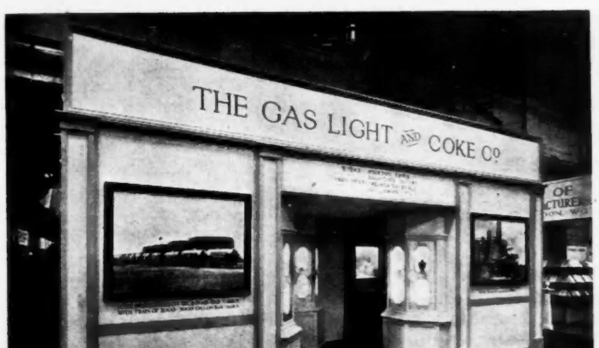
The Calendar

Mar.		
3	Institute of Chemistry. Annual meeting.	Russell Square, London.
3	Society of Chemical Industry (London Section). Meeting. 8 p.m.	Burlington House, Piccadilly, W.1.
3	**Royal Society of Arts. Cantor Lecture: " Recent Improvements in Methods of Brickmaking " (III). A. B. Searle. 8 p.m.**	**John Street, Adelphi, London.**
4	Royal Institution. " X-Ray Determination of the Structure of Cellulose." Sir William Bragg. 5.15 p.m.	21, Albemarle Street, W.1.
4	Birkbeck College Chemical Society. " The Migration of Hydrocarbon Radicles in Optically Active Compounds. Prof. A. McKenzie. 6 p.m.	Bream's Buildings, Fetter Lane, E.C.4.
5	Institution of Chemical Engineers. " The Formation and Growth of Crystals." Prof. W. E. Gibbs. 8 p.m. (Alteration of date.)	Geological Society Rooms, Burlington House, Piccadilly, W.1.
5	Royal Society of Arts: " Brewing as a Branch of Science." Prof. A. R. Ling. 8 p.m.	John Street, Adelphi, W.C.2.
5	Society of Public Analysts. Annual meeting. 8 p.m.	Burlington House, Piccadilly, W. 1.
6	Royal Society. Reading of Scientific Papers. 4.30 p.m.	Burlington House, Piccadilly, W.1.
6	Institute of Fuel: " The Cleaning of Coal." Dr. F. S. Sinnatt.	Bristol.
6	Chemical Society. Scientific meeting. 8 p.m.	Burlington House, W.1.
7	Chemical Engineering Group. Paper on " The Insulation of Heated and Cooled Surfaces," by J. S. Sard and R. F. Robinson (Joint Meeting with Glasgow Section).	Institution of Engineers and Shipbuilders, Glasgow.
10	Ceramic Society. " W.D. Circular Tunnel Kiln." Mr. A. N. Tarrant. 7.30 p.m.	North Staffs Technical College, Stoke-on-Trent.
12	Institute of Metals Annual Meeting followed by annual dinner and dance.	Hotel Victoria, London.
14	Society of Chemical Industry (Glasgow Section). Annual meeting. 6.45 p.m.	Glasgow Restaurant, Gordon Street.
21	Society of Chemical Industry. Joint meeting of Manchester and Liverpool Sections: " Flour Milling." Mr. J. Twomey. 6 p.m.	Muspratt Lecture Theatre, Liverpool University.
24	Society of Chemical Industry (Yorkshire Section). Annual meeting.	Leeds University.
27	Chemical Society's Annual Dinner. 7.30 p.m.	Hotel Victoria, London.
28	Society of Dyers and Colourists' Annual Dinner. 7 p.m.	Hotel Metropole, London.
29	Finsbury Technical College Old Students' Association. Dinner.	Trocadero Restaurant, London.
Apl.		
9	Institute of Fuel: " Smoke Prevention and Its Problems." Professor W. E. Gibbs.	Burlington House, Piccadilly, London.

Chemical Stands at the British Industries Fair







The End of the 1930 British Industries Fair

Record Attendance at Both Sections

Below we give some concluding notes on the 1930 British Industries Fair, which closed yesterday, after a remarkably successful fortnight. Some criticisms from the viewpoint of a chemical exhibitor and an appeal for better Fair advertising have been received from a correspondent.

Both from the point of view of the attendances and of the volume of business done, the British Industries Fair has been a success. At Olympia, which houses the chemical exhibits, the attendance during the first week exceeded 90,000, an increase of over 20 per cent. compared with the figures of last year. On Saturday trade buyers from home and overseas numbered 14,000, and the public almost as many, whilst in several sections of the Fair it was stated that more business had been done in the first week than during the whole of the previous Fair. On Wednesday the attendance was 16,943, nearly two thousand more than on the same day last year. A comparison of the numbers of overseas buyers visiting the London section shows that Holland, as usual, heads the list, with Canada second and the United States third. Altogether sixty countries are represented.

An interesting estimate by a chemical exhibitor at Olympia is put forward in the following letter, which we have received from Capt. J. Luck:—

"To show or not to show, is one of our annual puzzles, but somehow we are always to be found there. When you have overcome the many difficulties of getting your stand and its contents together, you are then ready to meet the thousands of overseas buyers, and if you are 'overseas' yourself, your exhibit assumes favourable dimensions.

"Speaking seriously, I put in my humble opinion that the chemical section, as an advertising factor, would be more powerful if properly presented. I do not think the Exhibition, as a whole, is sufficiently advertised in this country, one hardly hears of it outside one's own trade, and it is not boomed as it should be boomed. Its importance as the market-place for all that is best in British manufacture—British handiwork by British workmen—is not brought home to our own people. Such advertising as exists is too 'refaned,' too demure.

"Again, I suggest we have been too long in the hands of public contractors, who, year after year, continue to utilise the same material on the same old lines. Surely we can use our own ideas, and thus produce an impression on those who come to visit us, an impression of admiration for our aids to salesmanship. There is a lot to be desired in our World Fair, I am afraid. We have the men and the material, but, alas! we do not show it to the best of our ability. The chemical section itself is mostly a repetition of each succeeding year—it is tucked away, silent and aloof, a dead end of the show, which is the commencement of a reverse movement on the part of the visiting public.

"Wembley was one of the greatest thoughts of commercial England, but having risen to the occasion and put up a wonderful show, we have never again equalled it. We are naturally a race of exceptional retirement, but, business being as it is, surely it is necessary to be up and doing. That our next show will be alive and kicking should be our earnest determination. As it is, there is no money for exhibitors in exhibitions."

A correspondent who signs himself "A Buyer" writes: "Visiting the chemical section the other day, I gained a few impressions which may be interesting to those who pay out much money each year for the privilege of exhibiting. Personally, I find the colour scheme a little anæmic, with one or two exceptions the uniform white and blue created a 'flat' sensation—and, oh! the dismal lighting on most stands. . . Generally speaking a little more height and originality in colour—display and lighting—should be the thought for next year."

Encouraging numbers of trade enquiries and orders have been received at the heavy section of the Fair at Castle Bromwich, Birmingham, where the attendance for the first week was also in excess of that of any previous year. A number of oil engines and heavy power plant have been ordered for overseas, and very good reports have been received from the gas section.

The many visitors were impressed by the great advance made in the production of British refractory materials, and it is claimed that Britain can now successfully combat foreign competition in regard to price, quality or prompt delivery. They were able, also, to appreciate the fine results which have been obtained with regard to the preparation of tar for application on modern roads. The Research Association appears to have justified itself, and British road tar now complies exactly with the British standard specifications. The British Road Tar Association point out that its product is adaptable to any form of road work from the simplest resurfacing, tar spraying, to entire road reconstruction.

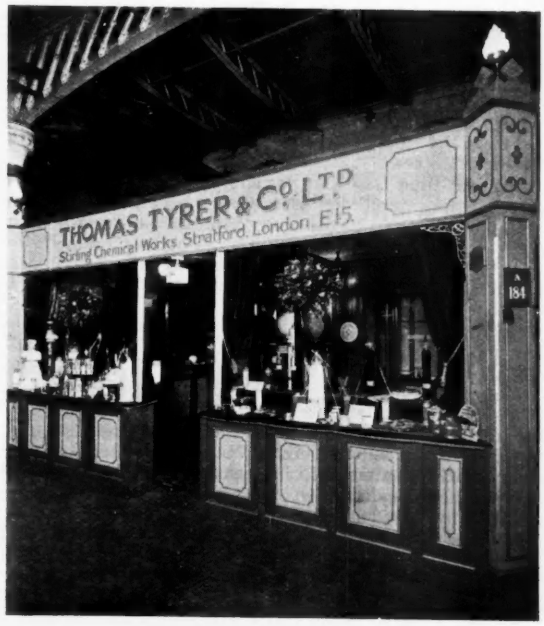
For the benefit of the engineer and chemist a large number of new products and apparatus have come on to the market for facilitating analysis with rapidity and accuracy and for determining temperatures, pressures, heat losses and a variety of other things. Of these the Foster Instrument Co., Letchworth, and the Cambridge Instrument Co., showed some good examples. One firm stages an automatic temperature control for the first time. Another item of interest was a pyrometer for reading furnace temperatures from 900° to 2,000° C.

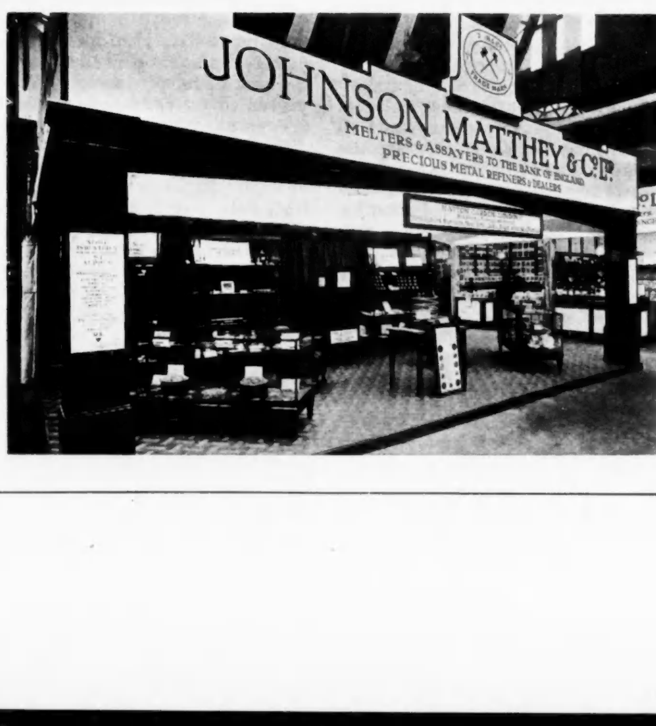
An enterprising exhibit at Birmingham was the stand of the Widnes Chamber of Commerce, of which Sir Max Muspratt is president. It was designed to show the exceptional advantages which this centre of chemical industry offers to manufacturers from every point of view, and a number of glass-covered, plush-lined compartments contained miniature specimens of products already manufactured in Widnes. Several compartments were purposely left vacant to emphasise the other sites available. There were distributed from the stand large numbers of an artistic brochure bearing in gold lettering the title, "Linked to the World," the slogan adopted several years ago by the Chamber to describe the exceptional geographical position of the town and the extent of distribution of its many products. It is borne out by several pages of descriptive matter, imposing photographs of engineering and chemical plant and maps.

Advantage of the Birmingham Fair was taken for a meeting of the Joint Gas Conference, at which over 150 delegates were present from all parts of the kingdom. The following resolution was carried with only three dissentients: "That it is the considered view of the Joint Conference of the National Gas Council, the Institution of Gas Engineers and the British Commercial Gas Association, that Part I of the Coal Mines Bill, which compels all coalowners to reduce their output, thereby increasing the price of coal, and which deprives consumers of their power to select suitable supplies of coal at agreed prices, is unfair to gas undertakings, and definitely inimical to the interests of gas consumers."

The President of the Board of Trade has set up a committee to examine the present situation of the Fair and to consider what means can be adopted to increase still further its utility to British trade. The committee is composed of: Viscount Chelmsford (chairman), Lord Barnby, Mr. John Beard, Sir Percival Bower, Sir John Corcoran, Sir Robert Donald, Sir William J. Larke, Mr. Guy Locock, Sir Sydney Skinner, Sir Gilbert Vyle and Mr. Robert Waddington. It is hoped that in the course of their inquiries the committee will investigate and report on the following questions: (1) The possibility of extending the scope of the Fair; (2) the date on which the Fair is to be held, and the desirability of holding a second Fair in the autumn; (3) the limitation of participation to manufacturers; (4) the best means of advertising the Fair at home and abroad, and of financing the publicity campaign; (5) the possibility of holding the Fair, or sections of the Fair, at centres abroad; (6) the possibility of organising a travelling Fair, either in ships or trains.

Chemical Stands at the British Industries Fair





Leading Signposts in Chemical Industry

A Comprehensive Sketch by Dr. E. F. Armstrong, F.R.S.

The lecture on "Signposts in Chemical Industry," delivered before the Society of Dyers and Colourists in Glasgow on February 14, by Dr. E. F. Armstrong, F.R.S., proved a brilliant historical sketch, at once imaginative and yet critically exact, of the main lines of development in comparatively modern industrial chemistry. It is equally notable for its matter and for its method of presentation.

"If thou wouldst be famous, and rich in splendid fruits,
Leave to bloom the flower of things and dig among the roots."

In these lines, it seems to me, Meredith has expressed the alpha and omega of the chemist's work. We chemists have progressed hitherto and we shall continue to progress in future because our investigations are essentially akin to digging among the roots. Our work is necessarily unseen by the nation at large and therefore unappreciated. Consequently it is only occasionally, when the world learns of this or that specific achievement in Chemical Industry or by Chemical Science, that the "flowers of success" are plucked, and then often the credit of doing so is bestowed on other shoulders than those of the actual worker.

Obviously, it is not until our achievements, resulting from long and patient work, first in the laboratory, then on the semi-technical scale, and finally in actual factory practice, lead to the production of materials of direct value to the public at large, that monuments can be and are built to honour the labours of the chemist. Such recognition must come long after the event; so, for example, it is only to-day that the world understands the significance of and celebrates certain names in connection with the production of synthetic dyes, of synthetic drugs, of nitrogenous fertilisers from the air, to give only a few examples.

During the time that the patient work of the chemist is going on in our numerous laboratories and factories, some of us should be actively seeking a means to ensure much quicker appreciation of his efforts. The real remedy is, however, in my opinion, to encourage and to speed up the spread of scientific education amongst all classes. This to some extent involves the use by the chemist of language easily understood by the layman to describe his work.

Although our specialised nomenclature is necessary as a form of shorthand when we are dealing with one another, and is undoubtedly superior to that existing in other sciences, signs are not wanting that it has already gone too far; it is almost impossible, for instance, for any middle-aged chemist, not engaged in teaching, to read a book on modern physical chemistry without some help in translating the jargon used. When we come to dealing with a larger public, we stand to lose everything by not making ourselves easily intelligible; language was meant to convey our thoughts and not to hide our learning.

New Forms of Skill for Old

To-day, more than ever, we must be alive to the fact, recently emphasised by a leading industrialist, that the valuable asset formerly possessed by Great Britain, namely, the skill of the artisan at the bench, is going and gone. It has been replaced by the skill of the scientist and technician; the chemist, physicist, and economist. National prosperity depends on the full recognition of this fact by the elector and by the politician, so that the policy of the country, both political and fiscal, may be shaped accordingly. As yet they, and all but a very few industrialists, have entirely failed to grasp the significance of the change. It is our duty as chemists to neglect no opportunity to emphasise its importance and to fit ourselves in every way to carry the burdens which will fall on us.

In general, the chemist is not working over the whole countryside of new knowledge, but along certain definite roads or paths bearing signposts. There are some critics of an older school who hold that we are too gregarious and imitative and that we lack originality, and sacrifice individuality in so doing. We have every sympathy for these, be they few or many of our calling, who would maintain their freedom thus; in our allegory we can say let them wander the hills, eschewing paths, ignoring the guide-posts, fervently hoping they will attain success. They will at least be happy, for their faith as chemical vagrants is that so well expressed in Meredith's words—

"Every failure is a step advanced
To him who will consider how it chanced."

Great must be the joy of him who can "stray on the uplands of possibility instead of plodding over the plains of fact"; for economic reasons most of us are compelled to do the latter, though we must admit that our tasks are sometimes of such tedium that they sterilise our thinking and prevent our accomplishing any original work of our own.

Paths of Chemical Progress

The paths along which organised chemical progress is proceeding have a habit of branching as they get further from their origin and hence we have a multiplicity of signposts to guide the later traveller, who, in following them, must earnestly take to heart the saying,

"Whatever enterprise man hath,
'Tis the first step that makes a path."

To-night, let us please to wander down some of these paths, reading the signs, learning from them as we pass, and hoping to arrive in turn at places where the very pathmakers are still busy with test tube and flask, crucible and balance, and all the other tools and appliances of our craft, and so see in advance the wonders which the next decade is certain to unfold before a larger public.

We leave the town perchance by the broad road bearing the sign "Industrial Catalysis," barely noticing at the wayside the simple stone to commemorate Williamson's investigations of the dehydration of alcohol by sulphuric acid to form ether but pausing at the more imposing monument to Sabatier, where we feel the glamour in the air of "La Catalyse en Chimie Organique."

Here the path forks and we may follow the branch signed "Hydrogenation," remembering that this was the first of the modern catalytic processes to be practised successfully on the large scale. Solid fats from liquid oils, edible fats from whale and fish oils, a fortune for the whaling industry made literally overnight, and yet I vouch that no captain of a whaler nor shareholder in a whaling company has ever heard of the name of Sabatier.

From fats, the hydrogenation technique spread to phenols, but far more important in its bearing on the future has been the study, still almost in its infancy, of the industrial methods of making cheap hydrogen itself in a very large quantity. The solution of this problem is perhaps the greatest desideratum in chemical industry; it would do more than anything else to solve the riddle presented by the coal industry.

Sulphuric Acid: A Foundation Stone of Industry

Turning to another path we see the guide-post "Sulphuric Acid," once regarded as one of the two foundation stones of industry. Catalytic methods are universal in its manufacture to-day and are leading to great advances in lowering the cost of its production. The modern contact process was visualised by Davy and realised by Squire and Messel, who first employed platinum to facilitate the oxidation of sulphur dioxide. The process made enormous strides in German hands—to-day it has received new vigour by the introduction of vanadium as a catalyst. When obsolete plants have been replaced, cheap sulphuric acid should no longer be a dream of the future.

Of the combination of the nitrogen of the air and hydrogen to form ammonia in quantities which are becoming astronomic in their magnitude, and at chemical factories which are the show places of to-day, taking the places of the shipyards and the motor-car factories of the past, enough has been written in other places. The experience gained in this work in handling and purifying large quantities of gases is being put to the utmost use in a series of new reactions, mostly entirely unexpected on theoretical grounds, involving for the most part great pressures and a variety of catalysts which are having to be studied individually and in detail by methods of trial and error. The outcome of these reactions, which are as yet only in their infancy, has been the synthesis of such

substances as methanol from water gas and of urea from carbon dioxide and ammonia.

The Great Oil Industry

It is next of interest to follow along quite another road of industrial progress, that of the great natural product petroleum, now called simply oil: few visualise the present and possible ramifications of this great industry now that the chemist has got a foothold in it. The natural gas obtained in such vast quantities from oil-bearing strata is no longer a waste product. High-pressure pipes take it very long distances to the industrial user, and to the mains of the gas companies in the cities. A gas of an average heating value of 1,000 B.T.U., costing only some 1½d. per 1,000 cubic feet at the source, is obviously an almost ideal source of heat, and the advantages accruing to those parts of America and of the Continent of Europe, where it is available, must cause a feeling of envy in the less fortunate British competitor. In America the natural gas is already being piped 500 miles and projects are in hand to double this distance; some 75 per cent. of the total gas used is natural gas.

When burned with an insufficient supply of air, natural gas is converted into finely divided flocculent carbon black, of which increasingly large quantities are required in the rubber-tyre industry. It is understood there is scope for the chemist to find better and more economical methods of producing it.

Before piping the natural gas it is advisable to scrub out the so-called liquefied petroleum gases, mainly propane and butane. Very large quantities of these are so obtained and transported in bulk in tank wagons at 100 lb./sq. in. pressure; they are used instead of oil gas to enrich manufactured water gas. They are easily conveyed by motor car, compressed in cylinders, to isolated farms or villages, where they can be used for lighting and cooking with great advantage to the comfort of the inhabitants. To the chemist the most interesting application of pentane is the manufacture of amyl chloride, and hence of amyl alcohol and amyl acetate by the Sharples process. At the factory in Virginia one hundred thousand gallons of hot pentane vapour are sent every 24 hours at a high velocity of 60 miles per hour through a reaction tube, where chlorine is introduced: the time of reaction is only 2½ seconds and never more than 8 oz. of chlorine are present at one time, though in all no less than 22 tons per day of chlorine are being used. The velocity of the gas in maintained sufficiently high to prevent ignition or persistence of ignition at the point where the vapours come into contact, so as to avoid risk of explosion. What an epic story could be written of such a reaction, which we rest content to describe in chemical phraseology!

Utilisation of Cracked Gases

We pass on our road without halting by the great oil-refining industry, and its newer adjunct cracking, to refer to the utilisation of the cracked gases as they are termed. These gases are rich in olefines and in one vapour phase process have a thermal value as high as 1,700 B.T.U.: even the gas from liquid phase cracking in which only one-third or less as much gas is produced per barrel of oil, rarely falls below 1,200 B.T.U. The most economical direct use of these gases is to enrich lower-grade gases for heating purposes, but the chemist cannot long remain content with the mere burning of such large and constant supplies of olefines and, accordingly, there is increasing effort on his part to convert them into chemical products, particularly ethylene-glycol and the alcohols. Methods are being studied for economically separating the individual olefines, particularly ethylene. For some time past glycol has been made in large quantities, which continue to increase as new applications for it are constantly being found. The manufacture of ethyl alcohol in bulk is about to commence and smaller quantities of isopropyl alcohol and of the isomeric butyl alcohols for which uses on a large scale have still to be found.

Time forbids our dwelling at length on this section of our chosen country—it is so full of absorbing interest that we feel able to challenge Anatole France where he says that "Knowledge does not bring happiness, and when men know a lot of history and geography, they will become sad." If the knowledge be in chemistry and physics, there is no time for an enthusiast to be sad, for he can make himself the centre of an indefinitely joyous mystery.

One other signpost on this path catches our eye before we turn back from it, a hint of a new way to higher organic compounds from methane, namely, its oxidation on a commercial scale to formaldehyde. This is done by means of nitric oxide by the so-called Bibb process. Air charged with 1 to 2 per cent. of nitric acid fumes and mixed with one-fifth of its volume of methane is preheated to 200°, and then kept at 250 to 560 in a chamber containing broken pieces of fireclay. Rapid reaction ensures practically all the methane being converted in eight seconds into formaldehyde and other oxidation products. Formaldehyde is at present made by catalytic processes from methyl alcohol which have been largely improved of recent years. It is the basis of the artificial resins which many of us believe are only at the threshold of their commercial application.

The "Via Catalytica"

It will have been realised that chemical synthesis, based on hydrocarbons, depends on a cheap and plentiful supply of petroleum raw materials, such as are non-existent in this country. It would seem that the Scottish Shale Oil Industry must be looked at through chemical spectacles, as well as both the high and low temperature tar industries, for it is unthinkable that the British Chemical Industry should stay out of this field.

Following yet another branch of the *Via Catalytica*, most fascinating are the syntheses based on ethyl alcohol as raw material, since they afford a striking object lesson of the variation of the product formed when the catalyst is modified. When alcohol is passed at about 300° C. over cuprous oxide produced at about 1,200° C., it is largely dehydrogenated and converted into aldehyde and hydrogen; aldehyde in larger yield is obtained when a mixture of alcohol and air is passed over a silver catalyst. When, however, as in the Zeisberg process, alcohol is passed over a copper oxide made at low temperatures (below 260° C.) containing a little cobalt, the result is ethylacetate. Apparently the aldehyde first formed undergoes a Canizzaro reaction, two molecules condensing together. Lastly, when alcohol and steam are passed over yet another catalyst the resulting product is acetone.

Thus, from one raw material, alcohol, three such diverse products as aldehyde, acetone and ethylacetate can be obtained, the one the starting point for the synthesis of acetic acid and cellulose acetate, the second the solvent for nitrocellulose in the leather-cloth and lacquer industries, and the third the essential solvent in the acetate silk industry.

New Modes of Industrial Fermentation

Before we pause, one other path tempts our investigation: it was formerly the street of the brewers and of the distillers, who, in the more flowery language of the poet, tormented the zymase of the yeast organism for the purpose of producing potable and potent fluids. The torments continue, but under the guiding hand of the chemist, the liquid products are no longer drinkable, though they are of valuable industrial application. For example, by appropriate organisms sugar is fermented in presence of hyposulphites to glycerin on the large scale, cellulose to methane, alcohol to acetic acid, starch to lactic acid, all established manufactures, which if fashion in a highly competitive and changeable world justifies, are capable of immediate enlargement. The most interesting industrial fermentation, however, is the production on a very large scale in America of butyl alcohol and acetone, together with a considerable weight of carbon dioxide and hydrogen. The organism was first developed in England to provide acetone during the war; butyl alcohol was always produced in equal quantity and at the time was of no value. Subsequently, not by hazard but as the result of unceasing search for a useful application, butyl acetate was found to be an ideal solvent for nitrocellulose, and its extended use has had much to do with the enormous and rapid development of the nitrocellulose lacquers in the motor car industry. The fermentation process was developed anew, this time primarily for the purpose of making butyl alcohol and the organism encouraged to produce the maximum of the butyl alcohol along with a minimum of acetone. The gases have not been allowed to go to waste either, for they have been converted by a specially developed catalytic process working at a high pressure into methyl alcohol. The whole process is a tribute to patient and well-directed research; the executive of the Commercial Solvents Company had learned with Meredith that:—

"Who in a labyrinth wandereth without clue
More than he wandereth doth himself undo."

C

Twenty years ago we should have rubbed our eyes with wonder if anyone had told us such syntheses would be possible industrially—to-day we are too busy—or is it too dazed ?—to stop to marvel at them.

"After too strong a beam, too bright a glory,
We ask, is this a dream or magic story ?"

I have guided you to-night along many paths, and yet there are many times as many more. It would have been easy and perhaps more profitable to have stayed at the end of any one of them, looking out into yet uncharted land, for this is where most of us are hopefully expecting to carry out our life work.

"The abyss is worth a leap, however wide,
When life, sweet life, is on the other side."

Naphthalene Distillation Plant Explosion

Report of Preliminary Inquiry

The following report has just been issued on the preliminary Board of Trade Inquiry into an explosion from a fractionating column at the Aire Tar Works of the Yorkshire Tar Distillers, Ltd., at Knottingley, on September 17, 1929. No one was killed or injured by the explosion, which is stated to have been due to the column being subjected to a pressure internally greater than it was capable of withstanding.

THE illustration below shows an elevation of the plant involved, which was used for the fractional distillation of naphthalene. The crude naphthalene, in a liquid state, was forced from a heating tank, where it had been liquefied by heating, into the still by air pressure. When sufficient had been forced into the still, the air pressure on the heating tank was released and the charge cock shut. The liquid in the still was then heated by a fire under the still, the initial vapour given off, which contained impurities, being passed through the fractioning column to separate the lighter and impure vapour from the heavier vapour, this latter condensing on the perforated plates fitted inside the column and draining back to the still. The impure vapour passed off from the column through an outlet, about 12 ft. above the base, to the condenser, from which it was allowed to drain into an open tank below. This was continued until all impurities had been passed over, when the condensate was diverted into a receiver tank for storage.

The plant had been used, prior to July of this year, for the distillation of oils, but was then adapted for naphthalene. To prevent the solidification of the liquid naphthalene during the process, steam heating, at various points, was fitted. A steam connection, ⅜-in. bore, fitted to the inlet pipe to the column, was included in these fittings, the steam being obtained direct from the boilers, which work at a pressure of about 90 lb. per square inch.

The Explosion

On September 17, 1929, the still was being charged in the usual manner. Three attendants were engaged in the operation, one being stationed at the still, to note when sufficient liquid had been forced into the still, and the others at the heating tank, to shut off the air pressure, and open the release cock when signalled to do so by the attendant at the still. The signal was passed for the air pressure to be shut off and released, and the still man attenpted to shut the charge cock. This, however, broke in the plug shank and the still was overcharged, part of the liquid passing over, through the bottom of the column, into the condenser. It was then found that the air release cock had gradually become choked with sublimed naphthalene, and in so doing gave the attendant the impression that the pressure was being released normally.

The naphthalene that had passed over into the column, condenser and connecting pipes, solidified, and it was decided to clear the condenser by heating the water in it. Liquid naphthalene eventually commenced to flow from the condenser outlet, and steam was then opened to the column, the cocks between the still and the column and condenser having previously been shut. The liquid continued to flow from the condenser outlet, and about 20 minutes later, after the steam had been opened to the column, a dull report was heard, and the column was displaced from the pedestal, breaking at the base. Several sections of the column and various connections on the plant were broken by the falling column.

Details of Column

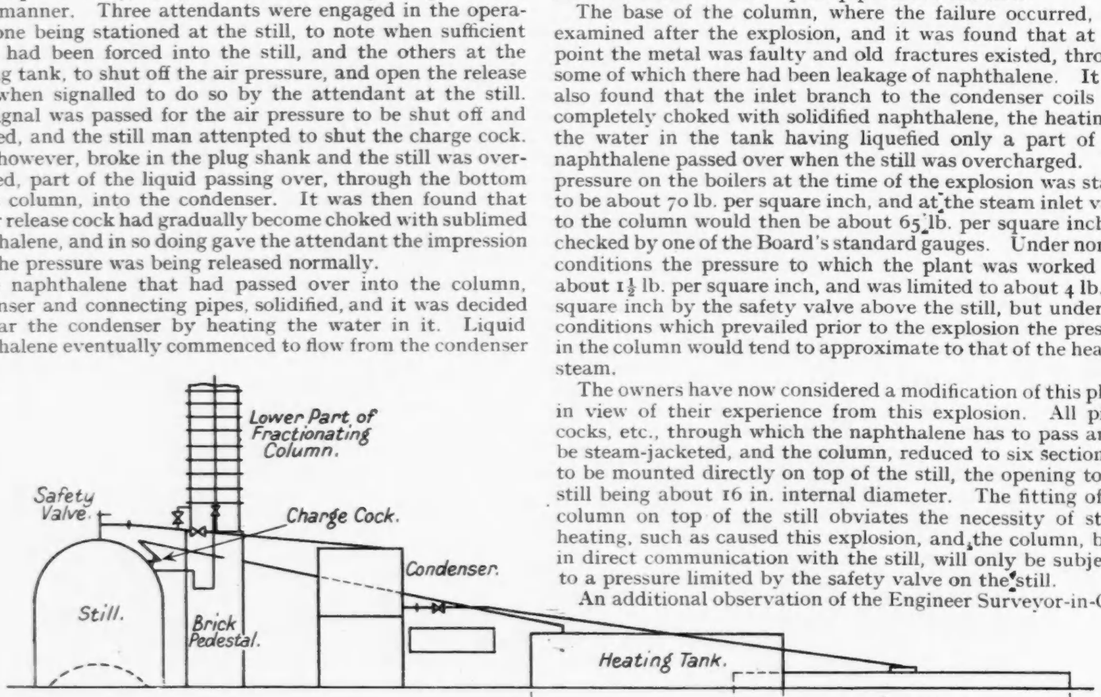
The column, which is stated to have been 33 years old, was made of cast iron and consisted of a number of sections 12 in. high, fitted internally with perforated plates, together with top and bottom sections, the total height being about 25 ft. The sections were about 30 in. square internally, the sides being about ½ in. thick, with flanges 36 in. overall and ¾ in. thick, each pair of flanges being secured together by 20 bolts ⅝ in. diameter.

The bottom section, which failed, was about 24 in. high and was closed at the base. On adjacent sides were cast two branch pieces, 3 in. internal diameter, one connected to the vapour pipe from the still, which was fitted with a ⅜ in. bore steam pipe for heating the column prior to distillation, and the other to the return pipe to the still, through which was drained any condensate that formed on the perforated plates. No relief valve was fitted on the column or connections, but a deadweight safety valve set to lift at about 4 lb. per square inch was fitted on the vapour pipe above the still.

The base of the column, where the failure occurred, was examined after the explosion, and it was found that at this point the metal was faulty and old fractures existed, through some of which there had been leakage of naphthalene. It was also found that the inlet branch to the condenser coils was completely choked with solidified naphthalene, the heating of the water in the tank having liquefied only a part of the naphthalene passed over when the still was overcharged. The pressure on the boilers at the time of the explosion was stated to be about 70 lb. per square inch, and at the steam inlet valve to the column would then be about 65 lb. per square inch, as checked by one of the Board's standard gauges. Under normal conditions the pressure to which the plant was worked was about 1½ lb. per square inch, and was limited to about 4 lb. per square inch by the safety valve above the still, but under the conditions which prevailed prior to the explosion the pressure in the column would tend to approximate to that of the heating steam.

The owners have now considered a modification of this plant, in view of their experience from this explosion. All pipes, cocks, etc., through which the naphthalene has to pass are to be steam-jacketed, and the column, reduced to six sections, is to be mounted directly on top of the still, the opening to the still being about 16 in. internal diameter. The fitting of the column on top of the still obviates the necessity of steam heating, such as caused this explosion, and the column, being in direct communication with the still, will only be subjected to a pressure limited by the safety valve on the still.

An additional observation of the Engineer Surveyor-in-Chief



AN ELEVATION OF THE PLANT.

is that. when the plant was altered and steam heating introduced at certain parts, it appears that the precaution of limiting, by means of reducing and safety valves, the pressure of the heating steam to the safe working pressure of the fractionating column was not taken, and in the circumstances described in the report over-pressure was bound to occur.

Soda Ash and Caustic Soda

An Analysis of the World's Trade

The following account, which is from an official United States source, gives an exhaustive survey of the production and sale of caustic soda and soda ash throughout the world.

THE two outstanding sodium compounds in world trade with respect to value and tonnage are soda ash (or sodium carbonate) and caustic soda. It is estimated that the United States, Great Britain, France and Germany supply 95 per cent. of the entire world exports.

American Trade in Caustic Soda

The United States exports less than 2 per cent. of its soda-ash production and 8 to 13 per cent. of its caustic soda. The control of the export market in sodas in the Far East by Great Britain has been long and continued, while the European market is conceded to continental producers, France and Germany. The United States leads the North American market and gets about one-fourth of the business in the South American market.

At present the British alkali organisation has, besides the British production of soda-ash, some 50,000 to 75,000 tons annually of the Lake Magadi sodium carbonates—(Trona) from Kenya (British controlled), which because of its lower cost is offered at such low prices that ammonia-process soda-ash from the United States is at present unable to compete.

Since the bulk of the caustic soda is made from soda-ash, the large soda-ash production of the United States may be looked upon as the reserve to draw on for an expansion of its caustic soda export trade. The significance of this will become apparent in considering why the United States alkali export future is in caustic soda, and not ash. The bulk of the American soda ash trade in Canada and Mexico consists of soda ash made from natural sodium carbonates. The British competition likewise influences the trends in these markets.

Soda ash is generally distributed to a comparatively small number of large users, whereas caustic soda in general goes to a larger number of small users. It is partly for this reason that the trade in soda ash in foreign markets which have long been British controlled is harder to break into than in the case of caustic soda, the demand for which arises to a great extent from small and new industries.

Raw Materials, Production and Uses of Sodas

No single country or group of countries has a monopoly on the raw materials from which soda alkalies are made. There are many salt (sodium chloride) and lime deposits throughout the world, besides the plentiful supply of salt dissolved in sea water.

In the arid regions of Western Nevada and South-Eastern California soluble salts also accumulate by evaporation of surface waters in undrained basins. The Great Salt Lake in Utah and the Dead Sea are likewise potential sources of salt. The deposits of sodium nitrate in Northern Chile, and sodium carbonate at Magadi, British East Africa, are conspicuous examples of accumulation due to favourable geologic and climatic conditions. Large deposits of salt have been found at considerable depths in Michigan, Kansas, Louisiana, Texas, New York, in the Strassfurt regions of Germany, at Salsburg in Austria, in the Province of Orenburg in South-Eastern Russia, at Norwich in Cheshire, England, in Alsace and Lorraine, in China, and many other regions.

Notwithstanding the abundant supplies of sodium chloride in various regions of the world, comparatively few of these deposits are drawn on for the production of soda alkalies, because of factors entering into their utilisation such as transportation, proximity to limestone supplies, and cheap power or fuel supplies. For example, an electrolytic soda plant recently established on the Pacific coast of the United States receives its salt supplies from Spain, notwithstanding the fact that at Searles Lake near the Pacific coast every day many hundred tons of sodium chloride recovered from the brines in the process of producing borax and potash are returned to the brines of the same lake, because of no other place to dispose of the salt economically.

Magnitude of World Soda Alkali Trade

In 1928 the total soda alkali exports of the four major exporting countries (calculating both the carbonates and caustic on a soda ash equivalency basis or 58 per cent. sodium oxide) amounted to nearly 945,000 short tons. This is estimated to represent 95 per cent. of the entire world exports of these commodities. In 1927 the total export was approximately 920,000 short tons on this soda ash basis. The gain of 25,000 tons is relatively small, considering that it covers the entire world trade. But the gains due to increased consumption, as a result of unusual world-wide activities in such industries as rayon and petroleum, were offset by decreased consumption in certain other world industries and the output of newly established soda plants engaged in furnishing a larger part of the domestic needs of some countries.

In 1927, exports of caustic soda and sodium carbonates and bicarbonate to the respective world sections by Great Britain and the United States, Germany and France, calculated on the soda ash basis, show that the greatest market is the Far East, which absorbed 44 per cent. of the total; Europe, 35 per cent.; North and South America together, 16 per cent.; Africa and unclassified countries, around 5 per cent.

Considering separately on a percentage basis the proportions of caustic soda and ash or carbonate exports in 1927, Europe is a market for nearly 37 per cent. of the ash and 40 per cent. of the caustic soda, North America for 5 per cent. of the ash and 10 per cent. of the caustic, South America for 6 per cent. of the ash and 15 per cent. of the caustic.

SODA ALKALI EXPORTS, 1927.
(Short tons).

Destination	Sodium carbonates	Caustic soda	Soda ash equivalency of caustic soda	Total alkalies on soda ash basis as 58 per cent. sodium oxide
Europe	236,700	66,300	88,200	324,900
North America, Central America, and West Indies	29,800	23,900	31,800	61,600
South America	40,100	34,700	46,100	86,200
Far East	282,200	89,700	119,400	401,600
Africa	2,100	4,100	5,400	7,500
Unclassified	24,500	10,200	13,500	38,000
Total	615,400	228,900	304,400	919,800

The European Market

Out of the 237,000 tons of carbonate exports to European countries, Germay and France together supply about 215,000 tons, or 80 per cent. Germany's share of this European carbonate trade represents 92 per cent. of its total export of these chemicals, while France's participation represents 95 per cent. of its entire carbonate exports. The activities of these two countries as exporters of sodas to other world markets is evidently negligible, while there is comparatively little sodium carbonate business in Europe not controlled by them at present. One of the economic factors influencing this control of the European soda markets by Germany and France is cost of transportation from plant to consumer. It is probably one of the reasons for the reduction of the United States exports to Europe. For example, in the United States the rail haul to seaboard, not including ocean transportation, is undoubtedly equal to transportation costs of certain foreign manufacturers operating in that market.

The gradual relinquishment by both the United States and Great Britain of a large part of the European soda ash and caustic soda market to France and Germany is evident from an examination of the proportion of their total exports going to that section in the years 1923, 1925 and 1927. In those

years, Great Britain's export of caustic soda to European countries were 20,300, 11,700 and 13,200 tons, respectively, and for sodium carbonates, 57,600, 25,900 and 21,800 tons. In the same year the United States caustic soda exports to Europe were 11,900, 3,300 and 1,300 tons, while the sodium carbonate trade was negligible.

North America

The bulk of the export trade in both carbonates and caustic soda to the North American section is controlled by the United States, while in South America Great Britain controls the market in sodium carbonates and gets about two-thirds of the caustic soda trade and the United States about one-third of the caustic business. The tonnage of these commodities taken in both of these world divisions from 1923 to 1927 has remained fairly steady.

In the Far East, Great Britain is the principal factor, the United States taking second place. Great Britain's largest market was in this region. Its exports of caustic soda more than doubled from 32,300 tons in 1923 to 66,900 tons in 1927, while sodium carbonate increased from 249,000 tons to nearly 275,000 tons.

In relation to the total world foreign trade in these sodas, estimated at 850,000 to 900,000 tons, the United States' part represents 11 to 12 per cent. Considered separately, the ash, carbonates and bicarbonates share for the United States is about 7 per cent. of the carbonate group of total world exports and the caustic soda proportion is from 25 to 27 per cent.

Great Britain's exports in 1928 represented 54 per cent. of the total, France's 23 per cent., United States 13 per cent., and the remainder was chiefly German.

MAJOR EXPORTERS OF SODIUM CARBONATES AND CAUSTIC SODA.
(Figures based on 1928 Exports—short tons.)

Country	Sodium carbonates	Caustic soda	Soda ash equivalency of caustic soda	Total alkali on soda ash basis as 58 per cent. sodium oxide
Breat Britain	356,000	120,000	159,600	515,600
United States	43,000	60,000	79,800	122,800
France	166,000	40,500	53,900	219,900
Germany	63,000	17,500	23,300	86,300
Total	628,000	238,000	316,600	944,600

Clothing Damaged by Creosote

Claim Against Manufacturing Company

DAMAGE to clothing caused through a barrel of creosote falling off a lorry and bursting open formed the subject of a claim in Bow County Court, before Judge Higgins, on Monday when Alice Jane Cadman and Elizabeth Cadman, her daughter-in-law, of 13, Lynden Street, Romford, sued the East London Manufacturing Co., of 105, Boleyn Road, East Ham, E., to recover £2 9s. 11d. and £1 9s. 11d. damages respectively.

Their evidence was to the effect that on November 6 last they were walking along Mawneys Lane, Romford, the younger plaintiff pushing a perambulator, when a barrel fell off the lorry and burst. Its contents were spread all over the pavement, and splashed up on their underclothing, ruining several garments, and also damaging the perambulator. They both alleged that the defendants had been negligent in allowing the barrel to fall from the lorry, and that it should have been guarded by someone.

Mr. Lott, for the defendants, said they regarded the occurrence as an accident, and not in any way a negligent act on their part. They were not denying liability, but they thought the amount of the damages claimed excessive.

The man in charge of the lorry said that as soon as he opened the side of the lorry the barrel fell out and burst open, and he got as much creosote as the ladies. There were 43 gall. of creosote in the barrel, and it weighed 4 cwt.

Judge Higgins pointed out that it was too heavy for the man to lift by himself, and inquired who was to help him. The witness replied that it would have been quite all right, as he would have used the skid to have lowered it.

His Honour eventually found in favour of the plaintiff Alice for £2 10s., and for Elizabeth for £1 2s. 6d., £3 12s. 6d. in all, and costs.

Brickmaking Improvements

Materials of Low Plasticity

THE second of the lectures under the Cantor Bequest, delivered by Mr. A. B. Searle, at the Royal Society of Arts Hall, on Monday, was devoted to the manufacture of bricks from shales, indurated clays and other materials of low plasticity, as distinct from the plastic clays described in the first lecture.

The enormous demand for bricks at the present time and the high cost of transport, he said, compel brick manufacturers to use almost any available " earth " and to employ processes which will convert many kinds of material into a homogeneous product from which bricks can be produced in an almost automatic manner. To ensure this, processes must be used which will deal equally well with wet clays, stony clays and dry shales, and it has been found that the best procedure is to dry the materials as much as may be necessary, grind them to powder and then use the product for the manufacture of bricks. The material so prepared may have the consistency of damp soil and contain about 10 per cent. of moisture, or a drier powder may be used. With both materials the bricks are shaped in powerful presses, the design of which must be modified to suit the consistency of the material.

The recent improvements in the various appliances used for the " stiff-plastic " and " semi-dry " processes were described and illustrated with lantern slides, and it was revealed that one firm alone, using these processes, has an output of more than one thousand million bricks per annum.

Improved Kilns

In these days of fuel economy, special attention has, naturally, been paid to improving the kilns in which bricks are burned, and the fuel consumption per thousand bricks has in the last fifty years, roughly, been halved by the introduction of continuous kilns. More recent improvements have been chiefly concerned with the quality of the bricks rather than with a reduction in the fuel consumption, and by the use of fans and systems of hot-air ducts considerable progress has been made in increasing the number of bricks burned in a given time. The most recent type of kiln is one in which the bricks are stacked about 6 ft. high on cars like railway trucks, which travel through a long brickwork building resembling a tunnel, and emerge fully baked at the farther end. The methods whereby the ironwork of the trucks is not damaged when the bricks on them are white-hot show that much ingenuity has been used in this type of kiln.

For many years automatic stokers for kilns were regarded as impracticable, but within the last few years many have been employed, and their number is rapidly increasing. The use of " archless " kilns has also extended, and the two newest brick kilns built in this country are of that type. They are much cheaper to build than arched kilns of equal capacity, and burn rather less fuel. The beautiful Tudor bricks which were used for many of the older houses cannot be made by some of the modern methods, but modifications of the latter are now used extensively for making a useful substitute known as " multi-coloured " bricks.

Bricks in Road Construction

The extraordinary durability of bricks when used in road construction was mentioned. This industry is far greater in the United States than in this country, and it is to be hoped that before long British road engineers and surveyors will realise the great and numerous advantages to be gained from the use of suitable bricks. In the past some of them have used bricks which were wholly unsuitable for the purpose, but that should not prejudice them, as there is no road more durable than one well laid with paving bricks of the best quality.

The lecturer concluded with a brief reference to the improvements recently made in the manufacture of firebricks, and particularly to their production by machinery. Much scientific investigation has been carried out in connection with this branch of the brickmaking industry, with beneficial results to all concerned. It is, in fact, another striking example of the profitable results which accrue from the skilful application of research along fundamental lines to the advancement of industrial processes and products.

The third lecture will be delivered on Monday next.

Chemical Matters in Parliament

Zinc Concentrates Contract

SIR H. SAMUEL (House of Commons, February 24) asked the President of the Board of Trade in what year State trading in zinc concentrates commenced; what had been the total expenditure by the British Treasury up to date; what had been the loss incurred in 1928 and the total loss up to the present time; and how long it is proposed that the present arrangements should continue.

Mr. W. R. Smith: The existing contract for the purchase of zinc concentrates was entered into in the year 1918. The total gross expenditure recorded to date in connection therewith is £15,718,109. The loss on trading incurred in 1928 was £1,133,388 and the total loss at March 31, 1929, as shown in the latest completed accounts, was £5,800,688. The contract expires on June 30, 1930, and it is expected that the balance of stocks then remaining will be disposed of by June 30, 1931.

Silk Industry

Mr. Kelly (House of Commons, February 20) asked whether the reports from inspectors show an increase in the injuries to men and women engaged in the artificial silk industry during the last six months.

Mr. Clynes: I am glad to state that as regards cases of inflammation of the eyes among workers employed in the spinning rooms, which has been the special trouble in this industry, the reports received show that on the whole there has been a marked improvement. This is no doubt due to the steps taken to secure efficient ventilation which it is agreed is the remedy for the mischief.

American Chemical Industry

Restricting the Flood of Technical Literature

AMERICA has been all but cursed with too many natural resources, stated Mr. Robert T. Baldwin, of the New York Section of the American Chemical Society, in a paper prepared for the Montreal Section of the Society of Chemical Industry. "Our applied science," he said, "might well have been even better than it is if we had less prodigal gifts of Nature. The American dollar in the chemical industry has to be nimble as never before, for capital, chemist, engineer, foreman, labourer and salesman have created a very complex fabric."

The corporate structure of the units of the American chemical industry was unlike that of Europe. Huge corporations and small ones existed in numbers, and even the recent and numerous consolidations and purchases had not reduced the American industry to the apparent condition of that of England France, and Germany. The tradition of a chemical industry probably came from the European economic scheme of a division of labour, and the curious nature of a business derived from the dark schemes of the alchemists. So long as the chemical industry preserved an air of mystery, it could specialise and stay apart from other business enterprises which consumed its wares.

War-time Structures

"Fifteen years ago an American chemist observed that the ideal building to house many chemical processes would be a large canvas circus tent. He had observed that we had made excellent dyestuffs in galvanized iron sheds and built elaborate steel and brick structures with some of the profits from the sheds. We are still trying to find something profitable to put into some of these elaborate war-time structures.

"Industries using large quantities of chemicals are very liable to make them on their own premises, provided they are sharply defined and do not include by-products. Familiar examples are the paper and rayon industries, and those using good tonnages of sulphuric acid. Furthermore, the effort to stop wastes for sanitary or any other reasons tends to put a chemical plant on a new spot. A familiar instance is that of a smelter making sulphuric acid and phosphate fertiliser. We are also faced with the rise of aliphatic hydrocarbon chemical plants tied on the delivery end of a petroleum industry or a so-called industrial waste—*i.e.*, the chemical industry is a superb scavenger. We also now have the use of the one element or thing put into a chemical reaction and not its package or diluent also. Familiar examples of that last are liquid sulphur dioxide replacing bisulphite of soda, liquid chlorine replacing bleaching powder, anhydrous ethanol, concentrated sodium sulphide. We are also rapidly developing processes of a catalytic nature.

Increasing Volume of Literature

"The literature of the industry steadily increases in volume. Something very definite will have to be done, however, to curb the amount if the industrial chemist is to keep in touch with all of it. The business policies of many chemical companies act as a check on the flood in that they prohibit by agreement with their technicians all papers which, in their judgment, disclose the nature and aim of their business; prohibit any disclosure relating to processes, but stimulate every possible disclosure as to the nature and uses of the products; or prohibit all communications.

"As to the origin of technical papers not on pure chemistry or physics, it is evident that most spring from organised laboratories. The fact is that the very number of organised laboratories in the United States provides the steadily growing need of the editorial blue pencil."

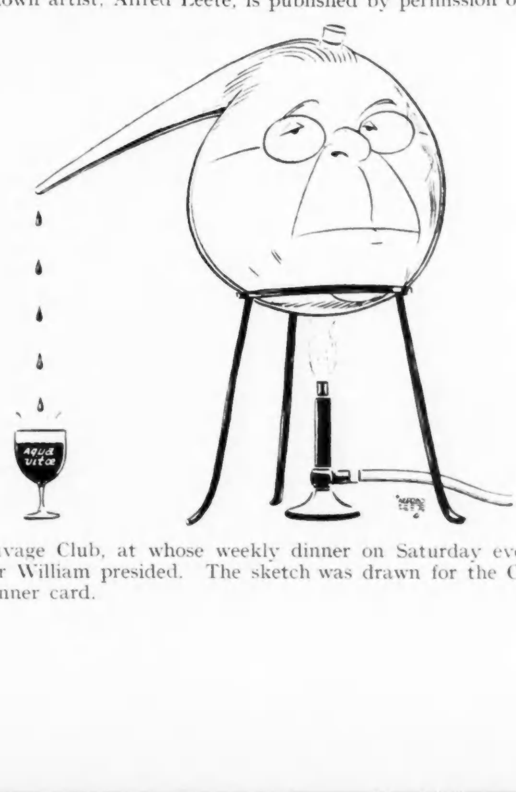
"S.O.S."

Charity Performances by Bouverie Players

THREE very successful performances of "S.O.S." were given in aid of charity by the "Bouverie Players" (Benn Brothers' Amateur Dramatic Society) at the New Scala Theatre on Monday, Tuesday and Wednesday of this week. There was a large and representative audience on each evening, and a total of nearly £700 was raised for the funds of the John Benn Hostel, the Timber Trades Charities and the Furnishing Trades Benevolent Association. The play includes some scenes of considerable intensity, and provides a test to which the company responded with considerable credit. In the difficult parts of Sir Julian and Owen Herriot, Mr. Gordon Grieve and Mr. Guy Catchpool respectively gave a good account of themselves, and were ably assisted by Miss Muriel Johns as Judy, and by Miss Phyllis Trimby in the thankless role of Lady Weir. There were also several successes to note in character parts, especially Miss Muriel Smith, whose appearances as a barmaid were greatly enjoyed; Mr. Harry Duck, as the righteous innkeeper of the Swan; Mr. William McNaught as the young lover, and Mr. James MacTavish, whose policeman was a triumph. Owing to the sudden illness of Mr. H. J. Wrench (of THE CHEMICAL AGE), his place as producer was taken by Mr. A. R. Heaton, of *The Times*, and *The Times* Orchestra also gave their services.

A New Portrait of Sir W. J. Pope

THE following cartoon of Sir William J. Pope, by the well-known artist, Alfred Leete, is published by permission of the



Savage Club, at whose weekly dinner on Saturday evening Sir William presided. The sketch was drawn for the Club's dinner card.

From Week to Week

CELLULOID DUST becoming ignited in a dust extractor is stated to have been the cause of an explosion in a Sheffield cutlery workshop on Monday.

PROFESSOR ARTHUR SMITHELLS, having completed the full term of three years as President of the Institute of Chemistry, will vacate the office at the annual general meeting on March 3. Dr. G. C. Clayton, who is at present abroad, but is expected home in April, has been nominated as his successor.

WHILE BEING DISCHARGED from the oil tanker *British Honour* at Newcastle, New South Wales, on Monday, a cargo of benzene ignited and blew up the forecastle. For a time there was danger to wharves and shipping in the vicinity from the large expanse of burning oil in the harbour, but the damage, which is estimated at £30,000, was confined to the ship.

AMONG THE ROMAN REMAINS found during excavation on the important site at Caistor St. Edmund's, near Norwich, was an annealing oven for the manufacture of glassware, dating from the latter part of the Roman occupation of Britain. As evidence of the local manufacture of glass, it is a notable addition to the knowledge of Romano-British industries.

THE DEPARTMENT OF MINERALOGY in Cambridge University, it is proposed, should be replaced by two departments, each with its own chair—a Department and Chair of Crystallography and a Department and Chair of Mineralogy and Petrology, the latter in closest possible relation with the Department of Geology. It is urged that the future development of crystallography lies mainly in fields bordering upon both physics and chemistry.

IMPERIAL CHEMICAL INDUSTRIES, LTD., have issued a statement to the effect that it has been brought to the notice of the board that the company is rumoured to be contemplating either a preference or debenture issue. The directors wish it to be known, in the interests of the shareholders, that there is no truth in these statements. They add that the company is closing its books for 1929 with a satisfactory increase in earnings over the figure for 1928, and that it has ample cash resources for all its requirements.

MR. G. ROBERTS, of C. Roberts, Ltd., Bradford, writes:—"In order to remove the possibility of any misapprehension we beg leave to inform you that the liquidation of our late company, C. Roberts and Co., Ltd., was effected for domestic reasons only, which do not concern our customers, and our business will henceforth be carried on at the same address by the same persons and under precisely the same management as hitherto, under the new name of C. Roberts, Ltd. The new company is authorised to receive all moneys due and owing to the old company. All moneys owing by the old company have already been paid by the liquidator thereof."

TWO NEW LOCOMOTIVES, each capable of drawing a load of nearly a hundred tons, and driven by petrol distilled in the process of the manufacture of gas, have just been put into commission at East Greenwich on the private railway of the South Metropolitan Gas Company. There are now twenty-two locomotives in service and over 20 miles of railway track connecting the various depots of the Company. Some idea of the activities of the railway may be gathered from the fact that during February approximately 3,000 tons of coal were unloaded every day from steamers at the jetty. In addition to coal and coke, iron and steel goods and oil and petrol are also transported.

"THE CHEMIST AND THE LINEN TRADE" formed the subject of an address by Mr. C. R. Nodder, of the Linen Industry Research Association, at Dundee. Formerly, he said, the chemist's influence had been felt only indirectly, but now there were ample signs of an increasing recognition of the usefulness of chemists working in and for the linen trade itself. He was dealing mainly with work which had been done, and was being done, at Lambeg; but they must realise that work which was being done elsewhere and for other trades was of very considerable value to the linen industry. An important feature of investigation at Lambeg was the early recognition of the fact, and all that it entailed, that in the ordinary scotched fibre of commerce they were dealing not with pure flax fibre, but with a complex assembly of plant tissues.

DR. ARTHUR D. LITTLE, of New York (last year's President of the Society of Chemical Industry) has been appointed chairman of the American Chemistry Committee in connection with the Chicago World's Fair of 1933.

LONDON UNIVERSITY has conferred the degrees of D.Sc. in Chemistry on Mr. B. Ghosh (internal student, University College), and of D.Sc. in Physics on Mr. L. Hartshorn (internal student, Imperial College).

MR. WILLIAM H. FENWICK, secretary of the Incorporated Oil Seed Association, is retiring as from March 26, after over 57 years' service with the Association, and Mr. Ernest E. Fenwick has been appointed secretary in his place.

RECENT WILLS INCLUDE Mr. Herbert Horsfall, of 7, Whitehead Lane, Primrose Hill, Huddersfield, Yorkshire, dyer, £5,129; Mr. Charles Cameron, Bootle, for many years manager and director of Johnson's Dyeworks (net personalty £8,964), £9,006.

SWISS EXPORTS of aniline, anthracene and naphthalene dyes and other tar colours during 1929 amounted to 8,109 tons, valued at 79,100,000 francs, as against 7,652 tons and 73,700,000 francs in 1928. Germany, the United States, France and Great Britain were Switzerland's chief customers, with 12·8, 10·4, 8·9 and 8·2 million francs respectively.

CHEMICALS AND COKE OVENS, LTD., Vintry House, Queen Street Place, E.C.4, announce that their new telephone number is Central 1411 (2 lines). The Rubber, Asbestos and Belting Co., owing to the necessity of keeping larger stocks, has removed to more convenient premises, containing ground-floor showrooms, at 11, Albert Place, Deansgate, Manchester.

THE INSTITUTE OF CHEMISTRY reports for the past year the election of 63 fellows and 240 new associates, the admission of 188 new students, and the death of 26 fellows, 10 associates and 6 students. The register on January 31 last contained the names of 5,714 members (1,886 fellows, 3,828 associates, and 717 registered students). This shows an increase of 156 members and 20 students.

A NEW COMPANY for the purpose of undertaking the utilisation of coal by-products and the extraction of oil and its residues, such as fertilisers, from coal is being formed at Sydney, Australia. Local rights over well-known German processes have, it is stated, been acquired. Both the Federal and State Governments have promised to go into the question of the establishment of an industry along these lines on the coalfields, and it is considered highly probable that they will give the new enterprise their co-operation.

A MYSTERIOUS FATALITY at the West Norfolk Farmers' Manure and Chemical Co., Ltd., was investigated at an inquest held at King's Lynn on Thursday, February 20, on Robert Walter Scott, who was found unconscious on a pump platform at the works, bleeding from a wound in the throat. A doctor stated that a post mortem revealed no organic reason why Scott should fall suddenly, and the jury returned a verdict that death was caused by "injuries received in a fall, there being no evidence to show why or how he fell."

SPIRITED COMPETITION between European and local interest in the match trade in Siam may be a preliminaryto the establishment of a European-controlled match factory in Bangkok, according to the reports now circulating in commercial circles. An interested merchant states: "At present European matches, under various brands, control about 85 per cent. of Siam's match trade, and the suppliers of these matches have evidently determined to maintain this percentage, because they have entered into spirited competition with a local company, despite the fact that they are handicapped by an import duty of 21·60 ticals per case. European matches can now be bought for as little as 29 ticals per case."

Obituary

COLONEL ALEX. SINCLAIR, of Swansea, manager for 40 years of Messrs. Vivian and Sons' electro-chemical works, Swansea.

MR. ALAN CAMPBELL SWINTON, F.R.S., the distinguished consulting engineer and expert on X-rays and television, on February 19, aged 66.

MR. FREDERICK VICTOR DUTTON, agricultural analyst to the Devon County Council, on February 13. He had carried out a very large amount of work in regard to analyses of fertilisers, feeding stuff, sheep dips, etc., and had a great knowledge of Devon soil compositions.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

323,180. DYEING PROCESSES. British Celanese, Ltd., 22, Hanover Square, London, and G. H. Ellis, British Celanese, Spondon, near Derby. Application date, June 22, 1928.

The process is for dyeing goods containing organic substitution derivatives of cellulose and cotton or other cellulose fibres. The goods are treated with a tannin mordant such as commercial tanning, tanning agents such as myrabolam, and synthetic tannins such as sulphurised phenols, *e.g.*, "Katanol," under such conditions that no substantial mordanting of the cellulose derivatives occurs. The tanning mordants are fixed by solutions of metal compounds such as tartar emetic. The goods may be dyed with basic dyestuffs to produce uniform or contrasting shades on the two types of fibre, according to the amount of mordant taken up. The cellulosic constituent or the cellulose derivative constituent may also be dyed with appropriate dyestuffs. In an example, a mixed fabric containing cotton and cellulose acetate is dyed, the cotton magenta and the cellulose acetate blue, in a dispersion of 1:4 di(methylamino)-anthraquinone which dyes the cellulose acetate but not the cotton. The fabric is then treated in succession with solutions of tannic acid, tartar emetic, and magenta crystals. Some other examples are also given.

323,187. ALICYCLIC LACTONES. G. Schroeter, 60, Luisenstrasse, and A. Gluschke, 12, Claudinstrasse, both in Berlin. Application date, August 23, 1928.

An α-halogen ketone of a hydrogenated hydrocarbon or a derivative is condensed with an alkali malonic ester, and the cyclo-ketonyl derivative of the malonic ester obtained is saponified and reduced, and carbon dioxide is finally eliminated from the resulting lactone carboxylic acid to obtain the simple lactone. Alternatively, carbon dioxide may be split off from the substituted malonic acid, and the keto-acetic acid reduced to form the lactone. If the cyclo-ketonyl-malonic ester or an ester of the lactone carboxylic acid is alkylated, alkylated lactones are obtained. The lactones can also be obtained by reducing a cycloketonyl-oxalic acid or ester, and converting the cyclo-alcohol-glycollic acid or ester obtained into the oxylactone or the lactone through the intermediary of the cyclo-ketonyl-acetic acid obtained by mineral acid treatment of the glycollic acid. In an example, 6-brom-5-keto-tetrahydronaphthalene is treated with sodium malonic acid methyl ester. The saponified product is heated to eliminate carbon dioxide, and the 5-keto-tetrahydronaphthalene-6-acetic acid obtained is hydrogenated in the presence of a nickel catalyst, and the product treated with acid to obtain the lactone of 5-hydroxy-tetrahydronaphthalene-6-acetic acid. In an alternative method, the keto-tetrahydronaphthalene-malonic acid is reduced with sodium amalgam and the product treated with acid to obtain 5-hydroxy-tetrahydronaphthalene-6-acetic-lactone-carboxylic acid from which the lactone of 5-hydroxy-tetrahydronaphthalene-6-acetic acid is obtained by elimination of carbon dioxide. Examples are also given of the preparation of the lactones of 1-methoxy-5-hydroxy-tetrahydronaphthalene-6-acetic acid, 1:4-dimethyl-5-hydroxy-tetrahydronaphthalene-6-acetic acid, 1 : 4-dimethyl-5-hydroxy- tetrahydronaphthalene - 6 - propionic acid (racemic hyposantonine), 1-hydroxy-octohydroanthracene-2-acetic acid, 3-hydroxy-5-keto-tetrahydronaphthalene-6-acetic acid, 5-hydroxy-tetrahydronaphthalene-6-glycollic acid, and 1-hydroxy-octo-hydroanthracene-2-glycollic acid. The preparation of the starting materials is also described.

323,205. CALCIUM HYPOCHLORITE. L. Mellersh Jackson, London. From Mathieson Alkali Works, 250, Park Avenue, New York. Application date, August 18, 1928.

A solution of sodium hydroxide is chlorinated to obtain sodium hypochlorite, which is then treated with calcium chloride directly or after separating the hypochlorite by freezing. The calcium hypochlorite is separated and the solution may be used for bleaching, or may be treated with lime to obtain a basic hypochlorite. Alternatively, the solution may be treated with sodium hydroxide or carbonate to precipitate the calcium, and the resulting hypochlorite solution may be used again.

323,240. ALCOHOLS. E. C. R. Marks, London. From E. I. Du Pont de Nemours and Co., Wilmington, Del., U.S.A. Application date, June 22, 1928.

Carbon monoxide and hydrogen are treated in the presence of a methanol catalyst and an alkali metal compound. The process is operated at a space velocity of the reacting gases more than five times the space velocity at which a methanol synthesis employing only the methanol catalyst would reach equilibrium under the same circumstances. The yield of alcohol other than methanol under the above conditions is greater than would be expected from the yields at lower space velocities. In an example, a mixture containing carbon monoxide 35 per cent. and hydrogen 50 per cent. is passed over a catalyst obtained by gently igniting basic zinc-ammonium chromate and mixing with potassium chromate. A temperature of 450° C., pressure of 280 atmospheres, and space velocity of at least 40,000 litres of gas per litre of catalyst per hour are employed. If a pressure of 1,000 atmospheres is employed with a catalyst of zinc chromite and potassium sulphate, a space velocity of at least 100,000 litres of gas per litre of catalyst per hour is employed. In another example, water-gas is treated at 225 atmospheres and 475° C. with a catalyst obtained by reducing a mixture of zinc and potassium chromate, employing a space velocity of at least 40,000 litres of gas per litre of catalyst per hour.

323,275. PHENOL-METHYLENE CONDENSATION PRODUCTS. H. Wade, London. From Bakelite Corporation, 247, Park Avenue, New York. Application date, October 2, 1928.

Phenol-methylene condensation productions which may contain an excess of phenol and are permanently fusible, are converted into a potentially reactive resin in which hexamethylene-tetramine or formaldehyde is added to the fusible resin, by first incorporating a phenol (including cresols) and then adding a methylene-containing body in such quantity that the resulting methylene-phenol ratio is above that of the initial condensation product. The addition of the phenol is in such amount as to give a phenol-methylene ratio of 9-12 : 6, and the methylene-containing substance is added in such amount as to give approximately equimolecular proportions of phenol and methylene. About 0·1 per cent. of a basic catalyst such as ammonia, hexamethylene-tetramine, hexamethylene-tetramine tri-phenol, etc., may be added. The resin can be hardened to give transparent products or moulding mixtures.

323,322. INDIARUBBER COMPOSITIONS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, November 19, 1928.

Natural or synthetic indiarubber is mixed with resinous esters of mono or polybasic acids with polyhydric alcohols or ethers thereof, before vulcanisation, to increase the strength of the product. Thus, acids such as abietic, phthalic, palmitic, etc., may be esterified with glycols, ethylene oxide, etc., and the products may be added in the proportion of about 2 per cent. Examples of mixes, treatment, and strength tests are given.

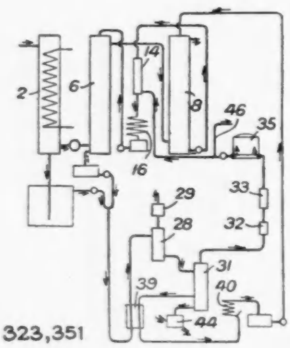
323,332. METAL CARBONYLS AND MOTOR SPIRIT. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, November 30, 1928.

Metals are suspended or made into a paste with a liquid or melt such as paraffin oil, paraffin wax, benzine, or the carbonyl of the metal, and carbon monoxide is passed under pressure into the paste which is agitated by this means, or by mechanical

means, heating, or electromagnetic means. Alternatively, the liquid may be saturated with carbon monoxide under pressure and passed over the metal, or carbon monoxide may be introduced into the reaction chamber simultaneously with the liquid saturated with carbon monoxide. To obtain a motor fuel containing iron carbonyl, reduced roasted pyrites is treated with benzine, saturated with carbon monoxide at ordinary temperature and 200 atmospheres pressure, at a temperature of 175° C. and 200 atmospheres pressure.

323,351. PURIFYING COKE OVEN GASES. Union Chimique Belge Soc. Anon., 61, Avenue Louise, Brussels. International Convention date, October 19, 1928.

Hot coke oven gas is cooled in a condenser 2 and treated with ammonia solution in a scrubber 6 and with cold neutral liquid



323,351

from the distillation apparatus in a scrubber 8. The two scrubbing liquors pass to a still 28 in which volatile acids are evolved, escaping ammonia being trapped in a condenser 29. The liquor is then treated in an element 31, and the evolved ammonia passes through condenser 32 and scrubber 33 to a holder 35. Liquid from the scrubber 8 is treated in a vessel 14 with sufficient gaseous ammonia from previously treated gases to render it alkaline, passed through a cooler 16, and used in the scrubber 6. The scrubber 8 is supplied with neutral liquor from the element 31 after passing through coolers 39, 40. Surplus liquor from the element 31 is decomposed in a vessel 44 with lime, to liberate fixed ammonia.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 294,113 (R. Battig), relating to production of hydrogen, see Vol. XIX, p. 296; 299,327 (I.G. Farbenindustrie Akt.-Ges.), relating to halogen-aryl-thioglycollic acids, see Vol. XIX, p. 640; 299,395 (W. G. Poetzsch), relating to electrolytical deposition of chromium, see Vol. XX, p. 7 (Metallurgical Section); 299,331 (Soc. of Chemical Industry in Basle), relating to azo dyestuffs and intermediate products, see Vol. XIX, p. 640; 302,321 (Consortium für Elektro-Chemische Industrie Ges.), relating to manufacture of trichlorethylene, see Vol. XX, p. 189; 310,757 (I.G. Farbenindustrie Akt.-Ges.), relating to orthoaryl-carboxy-amido-thioglycollic acids, see Vol. XXI, p. 10; 319,340 (F. Fischer), relating to production of higher hydrocarbons, see Vol. XXI, p. 533.

Specifications Accepted with Date of Application

295,322. Synthetic gummy or resinous material, Production of. Canadian Electro Products Co., Ltd. August 9, 1927. Addition to 280,246.

298,484. Refining low temperature tar, tar oils of any origin, crude benzene, and products obtained by the destructive hydrogenation of carbonaceous materials. F. Hofman and C. Wulff. October 6, 1927.

301,085. Pure rubber from rubber latex, Production of. Aktiebolaget Separator. November 24, 1927.

303,135. Esterification of cellulose. Ruth-Aldo Co., Inc. December 20, 1927.

303,751. Hard metal compositions. British Thomson-Houston Co., Ltd. January 7, 1928.

304,787. Printing with vat dyestuffs. I.G. Farbenindustrie Akt.-Ges., January 26, 1928. Addition to 279,864.

305,594. Separating formic acid from acetic acid. I.G. Farbenindustrie Akt.-Ges. February 7, 1928.

306,094. Elimination of the iron contained in bauxites or other aluminous ores. U. B. Voisin. February 15, 1928.

307,013. Rubber, Manufacture of. Goodyear Tire and Rubber Co. March 1, 1928.

308,275. Vulcanisation of natural or artificial rubber. I.G. Farbenindustrie Akt.-Ges. March 20, 1928.

309,118. Organic peroxides, Preparation of. J. Straub. April 5, 1928.

309,597. Sulphuric acid used for treatment of ores of titanium containing chromium, Process for rendering suitable for re-use. Deutsche Gasgluhlicht-Auer-Ges. April 14, 1928.

312,174. Condensation products from 1 : 3 : 3-trimethyl-2-methylene-indolins, Manufacture of. Soc. of Chemical Industry in Basle. May 19, 1928.

324,897. Hydration of olefines, Process and apparatus for. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) November 1, 1928.

324,902. Smelting ores to metal, matte, and slag. H. Skappel. August 3, 1928.

324,903. Light coloured products from paraffin wax, montan wax, and the like, Manufacture of. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*) September 27, 1928.

324,913. Condensation products from phenols and formaldehyde, Manufacture of. R. Hessen. November 5, 1928.

324,916. Salt masses, Apparatus for the treatment of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) November 5, 1928.

324,935. Dyestuff intermediates and the like, Production of. H. A. E. Drescher, D. A. W. Fairweather, J. Thomas, and Scottish Dyes, Ltd. August 4, 1928.

324,939. Decomposing hydrocarbons to produce hydrocarbons of higher molecular weight. T. S Wheeler, and Imperial Chemical Industries, Ltd. September 3, 1928.

324,959. Carbon black, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) August 3, 1928.

324,964. Substitution products of dibenzopyrenequinones, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) October 8, 1928.

324,966. Acid dyestuffs of the triphenylmethane series, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) October 10, 1928.

324,977. Semi-colloids and uniform colloids, Process and apparatus for. H. E. Potts. (*H. Plauson.*) November 8, 1928.

325,017. Alumina and potassium sulphate, Preparation of. G. S. Tilley, M. E. Dam, and E. S. Dam. November 13, 1928.

325,028. Exothermic catalytic gas reactions. H. Harter. November 24, 1928.

325,105. Acetaldehyde from ethyl alcohol, Production of. J. W. Woolcock, and Imperial Chemical Industries, Ltd. February 15, 1929.

325,115. Dihalogenethyl esters, Manufacture of. G. B. Ellis. (*Soc. des Usines Chimiques Rhône-Poulenc.*) February 19, 1929.

325,131. Alloys. C. Philippossian. November 3, 1928.

325,151. αδ-diamino- β-ketobutane dihydrochloride and 2-thiol-4- (5)-β-aminoethylglyoxaline, Production of. Boot's Pure Drug Co., Ltd., and F. L. Pyman. March 22, 1929.

325 152. Ethylene from acetylene, Manufacture of. J. Y. Johnson. (*I.G. Farbendindustrie Akt.-Ges.*) March 23, 1929.

Applications for Patents

[*In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.*]

Acton, W. Preventing crystallisation in boiled-sugar confectionery. 5,454. February 19.

Ash Co. (London), Ltd. Treating mixtures of liquids and solids. 5,463. February 18.

Bakelite Corporation. Varnishes, etc. 5,957. February 22. (United States, February 23, 1929.)

Bennis, A. W. Bleaching, drying, etc., fabrics. 5,662. February 20.

Binnie, D. Condensing unsaturated hydrocarbons. 5,660. February 20.

Carpmael, A. (I.G. Farbenindustrie Akt.-Ges.). Manufacture of active carbon. 5,295. February 17.

—— Manufacture of vat dyestuffs. 5,608. February 19.

—— Manufacture of 1-hydroxy-4-halogen-anthraquinone-2-sulphonic acids. 5,609. February 19.

—— Manufacture of wool dyestuffs. 5,610. February 19.

—— Manufacture of thiazolanthrone derivatives. 5,717. February 20.

—— Manufacture of conversion products of 1 : 2-anthraquinone-thioglycollic-carboxylic acid. 5,718. February 20.

—— Manufacture of acid wool dyestuffs of anthraquinone series. 5,883. February 21.

—— Manufacture of azo dyestuffs. 5,884. February 21.

Cocks, H. C. Protecting aluminium, etc., against corrosion. 5,970. February 22.

Compagnie de Béthune. Barbituric acid. 5,873. February 21. (France, January 16, 1930.)

Dreyfus, H. Manufacture of organic compounds. 5,572. February 19.

Elkington, H. D. (Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij). Conversion of phenols, etc., into hydrocarbons. 5,743. February 20.

—— Manufacture of valuable products from coal, tars, etc. 5,858. February 21.

Fairweather, D. A. W. Treatment of dyestuffs, etc. 5,575. February 19.

Gill, H. A., and Thomsen and Henriques. Treating aluminium silicates for separation of aluminium and silicon. 5,828. February 21.

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges.). Manufacture of azo dyestuffs. 5,253. February 17.

I.G. Farbenindustrie Akt.-Ges. Preparation of stable dispersions of solid substances. 5,288. February 17.

—— Dyeing cellulose esters, etc. 5,289. February 17.

—— Production of vat dyestuffs. 5,290. February 17.

—— Manufacture of bleaching-out layers. 5,425. February 18.

—— Production of vat dyestuffs. 5,844. February 21.

—— Destructive hydrogenation of coal, tars, etc. 5,987. February 22. (January 5, 1929.)

—— Manufacture of carbazole derivatives. 5,449. February 18. (Germany, January 5, 1929.)

—— Manufacture of benzimidazolone-stibinic acids. 5,545. February 19. (Germany, March 30, 1929.)

—— Manufacture of ortho-nitro-aryl-arsinic acids. 5,611. February 19. (Germany, February 19, 1929.)

—— Production of 1.1.2-trichlorethane. 5,881. February 21. (Germany, March 11, 1929.)

—— Manufacture of titanium preparations. 5,885. February 21.

Imperial Chemical Industries, Ltd. Refining crude petrol. 5,360 February 18.

—— Separating and purifying phenols, etc. 5,361. February 18.

—— Condensing unsaturated hydrocarbons. 5,660. February 20.

—— Production of acetaldehyde and acetic acid from acetylene. 5,676. February 20.

—— Production of hydrocyanic acid. 5,756. February 21.

—— Treating liquids with gases. 5,757. February 21.

—— Deaerating boiler feed-water. 5,947. February 22.

Lucas, O. D. Chemical treatment of fibrous materials. 5,252. February 17.

Madel, W. R. Separating and purifying phenols, etc. 5,361. February 18.

Ruhrchemie Akt.-Ges. Recovering higher hydrocarbons, etc. 5,344. February 17. (Germany, February 16, 1929.)

Scottish Dyes, Ltd. Treatment of dyestuffs, etc. 5,575. February 19.

Soc. of Chemical Industry in Basle. Manufacture of cellulose derivatives. 5,840. February 21. (Switzerland, April 11, 1929.)

—— Manufacture of cellulose derivatives. 5,841. February 21. (Switzerland, June 1, 1929.)

Sulphur and Smelting Corporation. Condensing sulphur. 5,332. February 17. (United States, June 5, 1929.)

Tanner, C. C. Production of acetaldehyde and acetic acid from acetylene. 5,676. February 20.

Thomas, J. Treatment of dyestuffs, etc. 5,575. February 19.

Wertheim, H. Simultaneous production of butyl alcohol and acetone by fermentation. 5,246, 5,247. February 17. (Austria, February 23, 1929.)

Big U.S. Oil Merger Proposal

The United States Department of Justice announces that proceedings are being taken to test the validity of the proposed merger of the Standard Oil Co. of New York and the Vacuum Oil Co., which was announced a week ago. Both the companies have specialised in lubricating oil and will market a large percentage of the petroleum products consumed in the United States, and will continue to carry on a widespread foreign business. The combined assets of the two concerns are over £176,400,000, of which the Standard Oil Co. of New York owns £139,000,000. Only the salient features are divulged, but the contract provides for uniting the assets of the two concerns under the name of the General Petroleum Corporation. Oil company officials point out that the Standard Oil Co. of New York operates foreign business only in Asia and the Balkans, and emphasise that the merger does not involve the Standard Oil Co. of New Jersey, which operates in Europe and South America. The Vacuum Oil Co. operates in all countries.

New Development in Water Treatment

Softening and Sterilisation by Lime

Of considerable interest is the new Langford water works plant of the Southend Water Works Co., at Southend-on-Sea, Essex, which provides a supply of 7,000,000 gallons of purified and softened water per day, the raw water being taken from the Rivers Chelmer, Ter and Blackwater, as well as to some extent from wells. On the average this water has a total hardness of 33 parts per 100,000, comprising 23·6 temporary and 9·4 permanent; the albuminoid ammonia is 0·0245 per 100,000, and the oxygen absorbed in 3 hours at 37° C. is 0·235.

The general method adopted is to allow the raw water to lie in storage reservoirs for 8 or 9 days and then to treat it with excess lime, which precipitates, as $CaCo_3$, almost all the temporary hardness (soluble bicarbonates), and at the same time gives a pronounced sterilisation. The treatment in the latter respect follows the suggestions made some years ago by Sir Alexander Houston of the Metropolitan Water Board, and has been adopted after extensive tests and research work. This is the first installation in the world to be constructed on these lines.

There is included a pumping plant of two sets of vertical, steam-driven, triple-expansion units, each with a duty of 4,000,000 gallons per day, with steam at 210 lb. per square inch pressure and 150° F. superheat. A third set is now to be erected. The raw water from the storage reservoir flows over a weir, which divides the water into two parts, one about 86 per cent. of the total volume and the other 14 per cent., and to the latter smaller bulk is added lime cream to form lime water. This is then mixed with the main bulk of the water, along with alumina coagulent, so that in the final water there is a definite excess of lime, about 2 grains per gallon. A heavy precipitate results, and after about 20 minutes the water is passed to primary settling tanks where the bulk of the precipitated material separates by gravity. The partly clear water then goes to three sets of long rectangular contact tanks, each 2,000,000 gallons capacity, and thence through a carbonating chamber for treatment with CO_2 gas, which first precipitates the excess lime as $CaCO_3$, and then to a slight extent redissolves it as bicarbonate. The final filtration takes place by means of a battery of 14 "Paterson" rapid gravity sand filters, with compressed air cleaning on well-known lines, while the Paterson Engineering Co., Ltd., have also devised an ingenious automatic reagent feed gear device for the lime cream, which adds to the hard water any desired amount of lime per unit volume of water. An oil-fired rotary kiln for using the precipitated $CaCO_3$ (chalk) to make lime on the spot for the process is included.

The operation of the plant is under the supervision of a resident chemist and bacteriologist who examines the purified water daily, and the results are reported to be excellent.

Pharmaceutical Papers at Edinburgh

Several interesting chemical papers were read at a meeting of the Pharmaceutical Society, in Edinburgh, on Wednesday, February 19. Mr. E. J. Schorn, Ph.C., A.I.C., dealing with "Quinoline Hydrogen Peroxide Reagent: A Distinguishing Colour Test for Aloes," said, taking advantage of the solubility of hydrogen peroxide in quinoline, it was found to act as a distinguishing colour test between the commercial varieties of aloes, so that any sample could be traced to its botanic source. Mr. D. B. Dott, Ph.C., F.I.C., F.R.S.E., read a paper on "The Official Tests for Resins of Jalap, Podophyllum and Scammony." In view of a revision of the British Pharmacopœ a, presently being carried out by the Pharmacopœia Commission, Mr. Dott criticised the existing official tests, pointing out defects and suggesting other characteristic tests for determining their identity and purity.

Mr. Dott submitted a further paper on "Acetylsalicylic Acid in Solution with Potassium Citrate," dealing with a point raised as to whether aspirin dissolved in water by means of sodium bicarbonate retained its distinctive chemical character and therapeutic properties, and whether the alternative method of dissolving aspirin in a solution of potassium citrate possessed any advantages. The result proved that the aspirin remained almost entirely stable under either condition, and that such a solution was a satisfactory method of administering aspirin in solution.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

Acid Acetic, 40% Tech.—£19 per ton.
Acid, Chromic.—1s. 0⅝d. per lb.
Acid Hydrochloric.—Spot, 3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.
Acid Nitric, 80° Tw.—Spot £20 to £25 per ton, makers' works according to district and quality.
Acid Sulphuric.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
Ammonia (Anhydrous).—Spot, 10d. per lb., d/d in cylinders.
Ammonium Bichromate.—8¼d. per lb.
Bisulphite of Lime.—£7 10s. per ton, f.o.r. London, packages free.
Bleaching Powder, 35%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.
Borax, Commercial.—Crystals, £19 10s. to £20 per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.
Calcium Chloride (Solid).—Spot, £4 15s. to £5 5s. per ton d/d in drums.
Chromium Oxide.—10d. and 10½d. per lb. according to quantity.
Copper Sulphate.—£25 to £25 10s. per ton.
Methylated Spirit 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.
Nickel Sulphate.—£38 per ton d/d.
Nickel Ammonia Sulphate.—£38 per ton d/d.
Potash Caustic.—£30 to £33 per ton.
Potassium Bichromate Crystals and Granular.—4⅞d. per lb. nett d/d U.K. spot; ground ½d. per lb. extra.
Potassium Chlorate.—3⅞d. per lb., ex-wharf, London, in cwt. kegs.
Potassium Chromate.—8¼d. per lb.
Salammoniac.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.
Salt Cake, Unground.—Spot, £3 7s. 6d. per ton d/d station in bulk.
Soda Ash, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.
Soda Caustic, Solid, 76/77%.—Spot, £14 10s. per ton, d/d station in drums.
Soda Crystals.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2 cwt. bags.
Sodium Acetate 97/98%.—£21 per ton.
Sodium Bicarbonate, Refined.—Spot, £10 10s. per ton d/d station in bags.
Sodium Bichromate Crystals.—3⅜d. per lb. nett d/d U.K. spot. Anhydrous ⅝d. per lb. extra.
Sodium Bisulphite Powder, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.
Sodium Chlorate.—2⅞d. per lb.
Sodium Chromate.—3½d. per lb.
Sodium Nitrite.—Spot, £19 per ton, d/d station in drums.
Sodium Phosphate.—£14 per ton, f.o.b. London, casks free.
Sodium Silicate, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.
Sodium Sulphate (Glauber Salts).—Spot, £4 2s. 6d. per ton, d/d address in bags.
Sodium Sulphide Conc. Solid.—Spot, £10 5s. per ton d/d in drums. Crystals—Spot, £7 10s. per ton d/d in sellers' casks.
Sodium Sulphite, Pea Crystals.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

Acid Carbolic Crystals.—7d. to 7½d. per lb. Crude 60's, 2s. 4½d. to 2s. 5d. Jan.-June, 2s. 4d. July-Dec. per gall.
Acid Cresylic 99/100.—2s. 2d. to 2s. 6d. per gall. Pure, 5s. 6d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 2s. 1d. to 2s. 3d. Dark, 1s. 6d. to 1s. 10d. Refined, 2s. 7d. to 2s. 10d. per gall.
Anthracene.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.
Anthracene Oil, Strained, 1080/1090.—4⅞d. to 5¼d. per gall. 1100, 5½d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).
Benzole.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.
Toluole.—90%, 1s. 9d. to 2s. 1d. per gall. Firm. Pure, 1s. 11d. to 2s. 5d. per gall.
Xylol.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.
Creosote.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, for Export, 6½d. to 6⅞d. per gall. Home, 4½d. per gall. d/d. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1½d. to 1¾d. per gall. ex works. Salty, 7½d. per gall.
Naphtha.—Crude, 8½d. to 8¾d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 6d. per gall. Solvent 90/190, 1s. to 1s. 2½d. per gall.
Naphthalene, Crude.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.
Naphthalene.—Crystals, £12 5s. per ton. Purified Crystals, £14 10s. per ton. Flaked, £14 to £15 per ton, according to districts.
Pitch.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.
Pyridine.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:
Acid Amidonaphthol Disulpho (1-8-2-4).—10s. 9d. per lb.
Acid Anthranilic.—6s. per lb. 100%.
Acid Benzoic.—1s. 8½d. per lb.
Acid Gamma.—3s. 9d. per lb. 100% d/d buyer's works.
Acid H.—2s. 3d. per lb. 100% d/d buyer's works.
Acid Naphthionic.—1s. 6d. per lb. 100% d/d buyer's works.
Acid Neville and Winther.—2s. 7d. per lb. 100% d/d buyer's works.
Acid Sulphanilic.—8½d. per lb. 100% d/d buyer's works.
Aniline Oil.—8½d. per lb., drums extra, d/d buyer's works.
Aniline Salts.—8½d. per lb. d/d buyer's works.
Benzaldehyde.—1s. 8d. per lb., packages extra, d/d buyer's works.
Benzidine Base.—2s. 4d. per lb. 100% d/d buyer's works.
Benzoic Acid.—1s. 8½d. per lb. d/d buyer's works.
o-Cresol 29/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.
m-Cresol 98/100%.—2s. 9d. per lb., in ton lots d/d.
p-Cresol 32/34° C.—2s. per lb., in ton lots d/d.
Dichloraniline.—1s. 10d. per lb.
Dimethylaniline.—1s. 9½d. per lb., drums extra d/d buyer's works.
Dinitrobenzene.—8d. per lb.
Dinitrochlorbenzene.—£74 per ton d/d.
Dinitrotoluene.—48/50° C., 7½d. per lb.; 66/68° C., 9d. per lb.
Diphenylamine.—1s. 8d. per lb. d/d buyer's works.
a-Naphthol.—1s. 11d. per lb. d/d buyer's works.
B-Naphthol.—£65 per ton in 1 ton lots, d/d buyer's works.
a-Naphthylamine.—1s. per lb. d/d buyer's works.
B-Naphthylamine.—2s. 9d. per lb. d/d buyer's works.
o-Nitraniline.—5s. 11d. per lb.
m-Nitraniline.—2s. 6d. per lb. d/d buyer's works.
p-Nitraniline.—1s. 8d. per lb. d/d buyer's works.
Nitrobenzene.—6½d. per lb. 5-cwt. lots, drums extra, d/d buyer's works.
Nitronaphthalene.—9d. per lb.
R. Salt.—2s. per lb. 100% d/d buyer's works.
Sodium Naphthionate.—1s. 6½d. per lb. 100% d/d buyer's works.
o-Toluidine.—8d. per lb., drums extra, d/d buyer's works.
p-Toluidine.—1s. 9d. per lb. d/d buyer's works.
m-Xylidine Acetate.—3s. 1d. per lb. 100%.
N. W. Acid.—4s. 9d. per lb. 100%.

Wood Distillation Products

Acetate of Lime.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.
Acetone.—£78 per ton.
Charcoal.—£6 to £8 10s. per ton, according to grade and locality.
Iron Liquor.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.
Wood Creosote.—1s. 9d. per gall., unrefined.
Wood Naphtha, Miscible.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.
Wood Tar.—£3 10s. to £4 10s. per ton.
Brown Sugar of Lead.—£38 per ton.

Rubber Chemicals

Antimony Sulphide.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.
Arsenic Sulphide, Yellow.—1s. 8d. to 1s. 10d. per lb.
Barytes.—£5 10s. to £7 per ton, according to quality.
Cadmium Sulphide.—5s. to 6s. per lb.
Carbon Bisulphide.—£25 to £27 10s. per ton, according to quantity.
Carbon Black.—4$\frac{1}{16}$d. to 4½d. per lb., ex wharf.
Carbon Tetrachloride.—£40 to £50 per ton, according to quantity, drums extra.
Chromium Oxide, Green.—1s. 2d. per lb.
Diphenylguanidine.—3s. 9d. per lb.
Lithopone, 30%.—£20 to £22 per ton.
Sulphur.—£9 10s. to £13 per ton, according to quality.
Sulphur Chloride.—4d. to 7d. per lb., carboys extra.
Sulphur Precip. B.P.—£55 to £60 per ton.
Zinc Sulphide.—8d. to 11d. per lb

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton, ex wharf London, barrels free.
ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.
ACID, BENZOIC B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £32 per ton; powder, £36 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 10½d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 7d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 3½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.
BISMUTH CARBONATE.—8s. 9d. per lb.
BISMUTH CITRATE.—8s. 3d. per lb.
BISMUTH SALICYLATE.—8s. 3d. per lb.
BISMUTH SUBNITRATE.—7s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 3d. per lb.
BISMUTH OXIDE.—11s. 3d. per lb.
BISMUTH SUBCHLORIDE.—10s. 3d. per lb.
BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb.
BORAX B.P.—Crystal, £21 per ton; powder, £22 per ton; For one ton lots and upwa ds. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 2s. od. per lb.; potassium, 1s. 8d. per lb.; granular, 1s. 5¼d. to 1s. 7¾d. per lb.; sodium, 1s. 11d. per lb. Prices for 1 cwt. lots.
CALCIUM LACTATE.—B.P., 1s. 0½d. to 1s. 3d. per lb., in 1-cwt. lots.
CAMPHOR.—Refined flowers, 3s. 3d. to 3s. 4d. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—11d. to 1s. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 9d. per lb. Green, 2s. 10d. to 3s. per lb. U.S.P., 2s. 7d. to 2s. 10d. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¾d. to 9¼d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 17s. 6d. per lb. net; Synthetic, 9s. 6d. to 11s. 9d. per lb.; Synthetic detached crystals, 9s. 6d. to 11s. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.
METHYL SULPHONAL.—18s. 6d. to 20s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 8½d. to 4s. 1d. per lb.
PHENAZONE.—5s. 11d. to 6s. 1½d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—103s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 6d. per lb. in 28 lb. lots. Smaller quantities 1d. per lb. more.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—43s. 6d. per lb.
SALOL.—2s. 3d. to 2s. 6d. per lb.
SODIUM BENZOATE B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911, AND U.S.P. VIII.—2s. 2d. per lb., B.P.C. 1923, and U.S.P. IX—2s. 6d. per lb. Prices for 28 lb. lots. Smaller quantities 1d. per lb. more.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—100s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. per lb. Crystal, 1s. 11d. to 2s. 1d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHIDE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—9s. 6d. to 10s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss, 7s. 6d. to 8s. 6d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—12s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—12s. per lb.
AMYL SALICYLATE.—3s. per lb.
ANETHOL (M.P. 21/22° C.).—6s. 6d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZYL BENZOATE.—2s. 3d. per lb.
CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.
COUMARIN.—8s. 3d. per lb.
CITRONELLOL.—10s. 6d. per lb.
CITRAL.—8s. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—10s. per lb.
GERANIOL (PALMAROSA).—19s. per lb.
GERANIOL.—7s. 6d. to 10s. per lb.
HELIOTROPINE.—7s. per lb.
ISO EUGENOL.—12s. per lb.
LINALOL.—Ex Bois de Rose, 12s. per lb. Ex Shui Oil, 10s. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—9s. 6d. per lb.
RHODINOL.—48s. per lb.
SAFROL.—2s. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—13s. to 14s. 6d. per lb. Ex Guaiacol, 12s. 6d. to 13s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. per lb.
ANISE OIL.—4s. 3d. per lb.
BERGAMOT OIL.—12s. 3d. per lb.
BOURBON GERANIUM OIL.—16s. 6d. per lb.
CAMPHOR OIL, WHITE.—160s. per lb.
CASSIA OIL, 80/85%.—4s. 9d. per lb.
CINNAMON OIL LEAF.—7s. 9d. per oz.
CITRONELLA OIL.—Java, 2s. 8d. per lb., c.i.f. U.K. port; pure, Ceylon, 2s. 6d. per lb.
CLOVE OIL (90/92%).—7s. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 9d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, 12s. 3d., per lb.
LEMON OIL.—7s. 6d. per lb.
LEMONGRASS OIL.—4s. per lb.
ORANGE, SWEET.—12s. 9d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent aud impartial opinions.*

London, February 27, 1930.

PRICES generally have remained steady during the current week and business has been good. There has also been a fair amount of export business.

General Chemicals

ACETONE.—£71 10s. to £80 per ton, according to quantity and firm.

ACETIC ACID is very firm and in good demand, with prices unchanged at £36 10s. for 80% technical and £37 10s. per ton for 80% edible.

ACID LACTIC is unchanged at £43 per ton for 50% by weight, and in good demand.

ACID OXALIC.—The good demand continues, with prices firm at £30 7s. 6d. to £32 per ton, according to quantity.

ACID TARTARIC continues in good demand at about 1s. 3½d. per lb., less 5%.

ALUMINA SULPHATE continues very firm at £8 to £8 15s. per ton for the 17/18% iron-free quality.

ARSENIC.—£16 5s. to £16 10s. per ton, free on rails at mines.

BORAX is unchanged and firm at recently advanced prices.

CITRIC ACID is easier at 1s. 11½d. per lb., less 5%.

CREAM OF TARTAR is a little easier at 102s. per cwt., and in fair demand.

COPPER SULPHATE.—£28 per ton, less 5%.

FORMALDEHYDE is in good request at about £36 per ton.

LEAD ACETATE.—Unchanged at £44 per ton for white, with brown £1 per ton less, with a fair demand.

LEAD NITRATE remains unchanged and steady at about £33 per ton.

LIME ACETATE.—Unchanged.

LITHOPONE.—£19 15s. to £23 per ton, according to quality, and in regular demand.

POTASSIUM CARBONATE is in good request at £27 per ton for 96/98%, arsenic free.

PERMANGANATE OF POTASH is firm, with quite a good demand at 5¼d. per lb. for the B.P. needle crystals.

SODIUM ACETATE.—Unchanged at about £21 10s. to £22 per ton, and in steady demand.

SODIUM BICHROMATE is firm at 3⅜d. per lb., with steady demand.

SODIUM HYPOSULPHITE CRYSTALS.—COMMERCIAL, £8 10s. to £9 per ton. PHOTOGRAPHIC CRYSTALS, £14 to £15 per ton.

SODIUM NITRITE is firm at £20 per ton, with a steady demand.

SODIUM PRUSSIATE.—Unchanged and firm at 4¾d. to 5¼d. per lb., according to quantity.

SODIUM SULPHIDE continues firm and unchanged.

TARTAR EMETIC.—11d. per lb., but in rather poor demand.

ZINC SULPHATE.—Unchanged at £13 10s. per ton.

Coal Tar Products

THE coal tar products market remains unchanged from last week, there being little inquiry.

MOTOR BENZOL is unaltered at about 1s. 5½d. to 1s. 6d. per gallon f.o.r.

SOLVENT NAPHTHA remains at about 1s. 2½d. to 1s. 3d. per gallon, f.o.r.

HEAVY NAPHTHA is quoted at about 1s. 1d. per gallon, f.o.r.

CREOSOTE OIL is unchanged at 3d. to 3¼d. per gallon, f.o.r. in the North, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID is quoted at 2s. per gallon for the 98/100% quality, and at 1s. 10d. per gallon ex works for the dark quality, 95/97%.

NAPHTHALENES.—The fire-lighter quality is quoted at £3 10s. to £3 15s. per ton; the 74/76 quality at £4 to £4 5s. per ton; and the 76/78 quality at about £5 per ton.

PITCH.—Makers are asking 45s. to 47s. 6d. per ton, f.o.b. East Coast port, but there is little business for early delivery.

The following additional prices have been supplied :—

CARBOLIC ACID.—A fair amount of inquiry is noticeable, but prices are unchanged at 7d. to 7½d. per lb., according to quantity.

CRESYLIC ACID.—Generally speaking, unchanged. Pale 98%, 2s. 1d. to 2s. 2d. per gallon. Refined, 2s. 7d. to 2s. 10d. per gallon. B.P. Cresol, 5s. per gallon.

ACETYL SALICYLIC ACID.—Prices vary according to quantity from 2s. 9d. to 2s. 11d. per lb.

PHENOLPHTHALEIN.—The schedule prices previously in force are maintained, namely 5s. 11d. to 6s. 1½d. per lb.

VANILLIN, ex Clove Oil, is quoted at 14s. in 1 cwt. lots.

METHYL SALICYLATE.—A good deal of inquiry is noticed for this time of the year, and prices are unchanged at previous levels, namely 1s. 3d. to 1s. 5d. per lb., according to quantity.

Chilean Nitrate Prices

THE Chilean Nitrate Committee, of Friars House, London, draw attention to the quotation, published in THE CHEMICAL AGE market reports on February 22, of Chilean nitrate of soda as "£9 9s. per ton, carriage paid, buyers' sidings, minimum five ton lots," and point out that this was incorrect. According to the official regulations for centralised sellings in Great Britain, the fixed price for 95 per cent. Chilean nitrate of soda for February-June delivery is £10 2s. per ton in lots of not less than six tons. All sales are stated to be subject to this regulation. We have pleasure in making the correction.

Latest Oil Prices

LONDON, February 26.—LINSEED OIL was steady. Spot, ex mill, £42 10s.; March, £39 15s.; March-April, £39 7s. 6d.; May-August and September-December, £39, naked. RAPE OIL was inactive. Crude, extracted, £37 10s.; technical, refined, £39, naked, ex wharf. COTTON OIL was steady. Egyptian, crude, £28; refined, common edible, £32 10s.; and deodorised, £34 10s., naked, ex mill. TURPENTINE was steady, unchanged. American, spot, 43s. 9d.; and March April, 44s. per cwt.

HULL, February 26.—LINSEED OIL.—Spot, £41 15s.; February, £41 10s.; March-April, £40; May-August, £39 12s. 6d. per ton, naked. COTTON OIL.—Egyptian crude, spot, £28; edible refined, spot, £31; spot technical, £30 10s.; deodorised, spot, £33 per ton naked. PALM KERNEL OIL.—Crude 5½ per cent., spot, £31 per ton, naked. GROUNDNUT OIL.—Crushed-extracted, spot, £33 10s.; deodorised, spot, £37 10s. per ton. SOYA OIL.—Extracted and crushed, spot, £30 10s.; deodorised, spot, £34 per ton. RAPE OIL.—Crushed-extracted, spot, £36 10s.; refined, spot, £38 10s. per ton. CASTOR OIL.—Pharmaceutical, spot, 47s.; first, 42s.; second, 40s. per cwt. COD OIL, 32s. per cwt. barrels.

South Wales By-Products

THERE has been a slight falling-off in South Wales by-product activities. Pitch quotations, however, are unchanged at about 45s. per ton delivered. Road tar maintains its brighter tendency, and has a fair call at from 11s. to 14s. per 40-gallon barrel delivered. Motor benzol is in steady and good request at from 1s. 4d. to 1s. 6d. per gallon. Naphthas are unchanged, solvent having a fair call at from 1s. 3d. to 1s. 5d. per gallon, but heavy is quiet at from 11d. to 1s. 1d. per gallon. Creosote remains weak with values unchanged from 3½d. to 4½d. per gallon. Refined tars have a steady call, prices being unchanged for both gasworks and coke-oven tar. The small request for sulphate of ammonia is still in evidence, quotations being from £10 2s. to £10 3s. per ton delivered. Patent fuel and coke exports are unchanged. Patent fuel export prices are 22s. 6d. per ton, ex ship Cardiff, and from 1s. 6d. to 2s. 6d. less, ex-ship Swansea and Newport. Coke prices for furnace and foundry grades are unchanged at all South Wales ports.

Scottish Coal Tar Products

ORDERS continue scarce but there is a better tone in the "tar acid" group and traders are awaiting developments. Water white products are also being watched with interest, but it is unlikely that values will appreciate, at any rate, in the meantime.

Cresylic Acid.—In better demand and prices firmer. Pale 99/100%, 1s. 11d. to 2s. 1d. per gallon; pale 97/99%, 1s. 9½d. to 1s. 10½d. per gallon; dark 97/99%, 1s. 8d. to 1s. 9d. per gallon; all ex works. High boiling acid is quiet at 1s. 9½d. to 1s. 11½d. per gallon.

Carbolic Sixties.—Nominal value remains at about 2s. 3d. to 2s. 5d. per gallon.

Creosote Oil.—Market remains dull but the disinfectant makers have been purchasing certain grades which is helping to some extent. Specification oil, 3½d. to 4d. per gallon; gas works ordinary, 2⅞d. to 3⅜d. per gallon; washed oil, 3d. to 3¼d. per gallon; all ex works in buyers' tank wagons.

Coal Tar Pitch.—The market is quiet and no alteration is expected this season. Nominal export value is about 47s. 6d. per ton f.a.s. Glasgow and truck loads for home trade command about 52s. 6d. to 55s. per ton.

Blast Furnace Pitch.—Some anxiety has been caused as stocks are increasing rapidly. The official prices remain at 30s. per ton rails works for home and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—The weather is affecting prompt orders but value is steady at 3⅞d. to 4⅛d. per gallon.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, February 26, 1930.

THE past week has seen little or no change in the Scottish Heavy Chemical Market, which, if anything, has been a little quieter. Inquiries received have been mostly for small parcels. Export inquiries still appear to be more active than those for home consumption. Prices are still practically unchanged since we last reported.

Industrial Chemicals

ACETONE, B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—This material is still scarce for immediate supply but prices remain unchanged as follows: 98/100% glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags, carriage paid U.K. stations. There are a few fairly cheap offers made from the Continent.

ACID CARBOLIC, ICE CRYSTALS.—Quoted 8d. per lb. delivered.

ACID CITRIC, B.P. CRYSTALS.—Quoted 2s. per lb., less 5%, ex store, prompt delivery. Rather cheaper offers for early delivery from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality 4s. per carboy. Dearsenicated quality, 5s. 6d per carboy, ex works, full wagon loads

ACID NITRIC, 80° QUALITY.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer at same price, viz.: 3¼d. per lb,. ex store. Offered from the Continent at 3½d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 4d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s 4½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at round about £7 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal about 2s. 6d. per ton less.

AMMONIA, ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Rather easier and Spot material now obtainable at round about £34 per ton, ex wharf. On offer for prompt shipment from China at £30 per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £18 per ton, ex wharf, prompt despatch from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f. U.K. ports. For Continental material price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. per ton to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £35 per ton, ex store. Continental mater al on offer at about £34 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—Price now £37 10s. per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½%, delivered.

POTASSIUM BICHROMATE.—Quoted 4⅝d. per lb. delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton, ex store. Offered from the Continent at £25 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100%.—Powder quoted £25 10s. per ton, ex wharf. Crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6⅝d. per lb., ex wharf.

SODA, CAUSTIC.—Powdered, 98/99%, £17 10s. per ton in drums, £18 15s. per ton in casks. Solid, 76/77%, £14 10s. per ton in drums, and £14 12s. 6d. per ton for 70/72% in drums, all carriage paid buyers' stations, minimum 4-ton lots, for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3⅜d. per lb., delivered buyers' premises with concession for contracts.

SODIUM CARBONATE. (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 13s. per ton, ex quay, minimum 4-ton lots with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Chilean producers are now offering at £10 2s. per ton, carriage paid buyers' sidings, minimum 6-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 55s. per ton, ex works, 57s. 6d. per ton delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid, 60/62%, £9 1 s per ton. Broken, 60/62%, £10 15s. per ton. Crystals, 30/32%, £7 17s. 6d. per ton, all delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. od. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE, 98%.—British material offered at round about £20 per ton, f.o b. U.K. ports.

ZINC SULPHATE.—Quoted £10 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Shale Oil Extraction in Sweden

EXPERIMENTAL shale oil extraction has been carried on for some months past at Kinnekulle, in the south-western part of Sweden, and about 2½ tons of crude oil have been obtained per day from a total of 60 tons of shale. Kinnekulle is a mountain or elevation on the shore of the second largest lake in Europe, and alum shale girdles the whole mountain in a heavy layer, covered by only a two-foot thick earth crust. There are, consequently, almost unlimited quantities of shale available.

The shale, however, is not particularly rich in oil, but the extraction is very inexpensive, and the shipping facilities are excellent on account of the nearness to the lake. As the shale, moreover, rests on a layer of limestone, it has been used for a long time as fuel for lime burning, during which process a thick white smoke issues from the top of the kiln, the colour being mainly due to escaping oil and by-products.

It is stated in *Swedish Export* (Stockholm) that in the new plant this vapour is distilled and the oil recovered and collected in tanks. A combustible gas of high heating value has also been obtained during the process, and this is now used for burning lime in a shaft furnace. The gas is really too fine for this use, as benzene and sulphur may be recovered from it. The benzene has been obtained in the same way as benzole at a gasworks, namely, by washing the gas with heavy oil. Another by-product is ammonia. Whether it will pay to extract these by-products on a commercial scale has not yet been determined.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, February 27, 1930.

The movement of most varieties of chemical products on the Manchester market during the past week can at the best only be described as moderate, for the requirements of the textile finishing and allied trades leave much to be desired. The fact that spinners of American cotton this week rejected the organised short-time proposals may be taken as less an indication of brighter prospects than of a lack of co-ordination. Meanwhile, price tendencies in respect of chemicals are, for the most part, all in the direction of continued steadiness.

Heavy Chemicals

Chlorate of soda is attracting some little attention and quotations for this are maintained at from £25 to £27 per ton, ex store, and according to quantity. The demand for hyposulphite of soda this week has been on somewhat restricted lines, though offers of this are steady at from £9 to £9 10s. per ton for the commercial quality and about £15 for the photographic. With regard to alkali, a moderate demand is reported at round £6 per ton, in contracts, with bicarbonate of soda firm and in fair request at £10. Enquiry for phosphate of soda just now is rather slow but the dibasic material is well held in the neighbourhood of £11 per ton. Bichromate of soda is attracting some attention from buyers and prices are firm on the basis of 3⅜d. per lb., less 1 to 2½ per cent., according to quantity. A moderately active business is going through in the case of caustic soda, contract quotations for which range from £12 15s. to £14 per ton, according to quality. Sulphide of sodium is rather a quiet section, with the 60–65 per cent. concentrated solid grade on offer at from £10 to £14 per ton and the commercial material at from £8 2s. 6d. to £9 2s. 6d.

Of the potash products, yellow prussiate is moving off in fair quantities and the firmness of this section continues; current values range from about 6⅞d. to 7¼d. per lb., according to quantity. Keenly competitive prices are being indicated in respect of caustic potash, offers being at about £30 per ton upwards; a moderate trade in this material is going through. There is only a relatively small enquiry about in the case of permanganate of potash, but offers of this keep up fairly well in the region of 5¾d. per lb. for the B.P. grade and 5¼d. for the commercial. Chlorate of potash meets with a quiet demand, with quotations held at from about £26 to £28 per ton, according to quantity. A fair amount of buying interest is being shown in bichromate of potash and prices are firm at round 4⅜d. per lb. Carbonate of potash is moving in moderate quantities, and offers this week have kept up fairly well at from about £26 to £26 10s. per ton.

There is still only a comparatively quiet business passing in the case of arsenic, although at round £16 per ton at the mines for white powdered, Cornish makes, little or no change in the position of prices has taken place. Sulphate of copper is in moderate request at £26 5s. to £26 10s. per ton, f.o.b. Supplies of the acetates of lime are reported to be not too plentiful and prices are steady at £16 per ton for the grey quality and from £7 10s. to £7 15s. for the brown. Nitrate of lead is a comparatively quiet section and prices are easy in tendency at down to £33 per ton, with acetate in somewhat similar position at about £38 per ton for the brown quality and £38 10s. to £39 for the white.

Acids and Tar Products

Tartaric acid appears to be a shade steadier than before, values this week having been at from 1s. 3¼d. per lb. With regard to citric, buying interest is still on the quiet side and prices are easier at 1s. 10¾d. to 1s. 11d. per lb. There is a moderate demand about in the case of oxalic acid, offers of which are at about £1 12s. 6d. per cwt., ex store. Acetic acid keeps very steady and a fair business is passing at about £36 per ton for the 80 per cent. commercial quality and £66 for the glacial.

Among the tar products, trade in pitch is on quiet lines but prices remain at about 47s. 6d. per ton, f.o.b. The demand for creosote oil is likewise restricted and prices are easy at from 3¼d. to 4d. per gallon, naked. Crystal carbolic acid seems to be somewhat scarce than before for early delivery transactions, with offers at about 7½d. per lb., f.o.b.; crude 60's carbolic is now obtainable at down to 2s. 5d. per gallon, naked. Solvent naphtha is in moderate request at about 1s. 2½d. per gallon.

Future Prospects of Borax

Chairman's Hopes of Recovery

The Earl of Leven and Melville, chairman of Borax Consolidated, Ltd., reviewed in detail the affairs of the company at the annual meeting on Wednesday, in London. They had had a bad year, he said, from the profit-making point of view, and as a consequence, for the first time in 31 years, or since the formation of the company, were not able to recommend the payment of a dividend on the deferred ordinary shares.

The Price Problem

Referring to reports of impending agreements, he said that, owing to the laws of the United States, no agreements could be made that would in any way restrict trade or set prices, nor could any concern acquire such percentage of the trade relating to its industry as to constitute a monopoly. Therefore, so far as the domestic trade of the United States was concerned, no agreement could legally be made which would have that effect. But for foreign business, it was allowable to form an export association under certain conditions which may deal solely with export business, and this aspect of the situation was having attention. Competitive sellers had, for the most part, relieved the strain by quoting higher prices than those of the last six months of their financial year, when they were forced down to quite unprofitable figures. These advanced prices were being held by themselves and the leading producers, and, while there were still some disturbing elements, there was a reasonable prospect that the improvement could be maintained.

As to the current year, the industry was in a much healthier condition, but it had had a bad time, and could not be expected to make a miraculously quick recovery. It was very much easier to knock prices down than to build them up again to a profitable figure. They had to clear off old contracts at unremunerative prices before benefiting by the very moderate increase which had taken place. They hoped for some further increase, but it was very desirable that it should not be of such a character as to restrict consumption, and that prices should be kept at such a level as would foster enlarged industrial uses. There was a good prospect of borax finding new outlets as a consequence. It could be used with great advantage in the glass industry, where it facilitated manufacture and thereby reduced cost and also produced a glass of such quality that the loss in manufacture, handling and distribution was reduced. Their trouble had been a too large production of borax from various sources in comparison with the demand. The opening up of new outlets, would, therefore, help to solve the difficulties consequent upon overproduction, leading to cut-throat competition and, consequently, no reasonable margin of profit.

Raw Materials and Plant

Their new mine had been developed to show a practically unlimited amount of borate ore, which has proved to be the most economical yet known for borax manufacture. They had erected special calcining and concentrating plant to deal with this, and their refinery at Wilmington, California, had been enlarged and equipped to refine ore and, by mass production, to produce borax at a figure which seemed to offer but little room for further reduction. With the increasing demand (sales of borax to date being ahead of last year), with a saving in distribution expenses and the cutting out of every expense capable of reduction, and a moderate recovery of prices, and with the advantages of low costs due to the new mineral, they hoped to be able to show again a satisfactory profit and loss account. They still had a predominant position in a growing industry, and enormous reserves of raw material in mines; their works at Wilmington, California, was the largest borax refinery in the world, and was equipped with the most modern plant for economical production, and they had a very fine world-wide organisation for the distribution of their goods. Also, they had a freehold property on Searles Lake of large potential value, containing the brines from which potash and borax were produced, and available, should they at any time determine to proceed with its exploitation.

The retiring directors (Mr. D. L. Howard and Mr. J. Gerstley) were re-elected.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

NEW FOREST PERFUMERY, LTD., Pinekona House, Lyndhurst, perfumery manufacturers. (C.C., 1/3/30.) £19 1s. 6d. January 14.

HUTCHISON (J.) AND CO., Nemlin Chemical Works, Whitefield, Manchester, chemical manufacturers. (C.C., 1/3/30.) £32 14s. 1d. January 15.

Mortgages and Charges

[***NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.***]

DRUG AND CHEMICAL CORPORATION, LTD., London, E.C. (M., 1/3/30.) Registered February 12. Land Registry charge, to bank; charged on 41, Lower Kennington Lane, S.E., and land adjacent. *£2,550. January 14, 1929.

Satisfaction

DRUG AND CHEMICAL CORPORATION, LTD., London, E.C. (M.S., 1/3/30.) Satisfaction registered February 12 £700, registered August 11, 1925.

London Gazette, &c.

Companies Winding Up Voluntarily

ASHTON AND PARSONS, LTD. (C.W.U.V., 1/3/30.) By special resolution, February 14. A. Barnsdale, F.C.A., appointed as liquidator.

BUTTERWORTH AND TURNER, LTD. (C.W.U.V., 1/3/30.) By special resolution, February 15. E. Moulds, certified accountant, 7a, Yorkshire Street, Burnley, appointed as liquidator.

Receiverships

CODY'S CASH CHEMISTS, LTD. (formerly W. Jarvis and Co., Ltd.). (R., 1/3/30.) E. N. Heath, of The Hampden Club, N.W.1, was appointed receiver and manager on February 12, 1930, under powers contained in debenture dated April 27, 1929.

HOMOCEA, LTD. (R., 1/3/30.) D. A. Davies, C.A., of Balfour House, 119-125, Finsbury Pavement, E.C.2, was appointed receiver on February 17, 1930, under powers contained in debenture dated December 1, 1914.

New Companies Registered

BRITISH CATADYN CO., LTD. Private company. Registered February 21. Capital, £100 in 1s. shares. To carry on the business of chemical manufacturers and importers, manufacturers of and dealers in sterilisers, disinfectants, and other chemical or industrial preparations, etc. A subscriber: F. Harwood, 24, Box Ridge Avenue, Purley.

FLUVAX SALES, LTD., 155, Fenchurch Street, E.C. Private company. Registered February 19. Capital, £100 in 10s. shares. To adopt an agreement with the Norman Trust and Investment Corporation, Ltd., to carry on, develop, and turn to account the business of Fluvax, to acquire the trade mark "Fluvax," and to carry on the business of chemists, druggists, chemical manufacturers, etc. Directors: H. A. C. Woodcock, G. Smith, G. N. Reeves.

H.S. SYNDICATE, LTD., Donegal House, 43, Monument Street, E.C. Private company. Registered February 19. Capital, £100 in 10s. shares. To acquire the patents or interest therein relating to a process for the extraction of benzene, motor and aviation spirit, volatile gases, compounds and by-products, products of oil-tar and ammoniacal liquor and coke and other residuals by the treatment of coal and other bituminous deposits, in Great Britain and elsewhere. Directors: P. P. Harmer, Dr. M. J. Stephan, T. Evans.

SIDDONS BY-PRODUCTS CO., LTD. Private company. Registered February 21. Capital, £500 in £1 shares. To carry on the business of dealers in and agents for chemicals, chemical products, etc. Directors: B. Wilkinson, 34, Kingsway, Alkington, Middleton, near Manchester; F. F. Siddons, Stanley House, Mary Street, Harpurhey, Manchester; C. Carlow, 42, Dean Lane, Moston, Manchester; T. R. Atherton, 6, Wallis Street, Newton Heath, Manchester; E. Payne, Sen.

SPED PRODUCTS, LTD. Private company. Registered February 21. Capital, £500 in £1 shares. To carry on the business of proprietors of patent medicines, manufacturers and distributors of chemical substances prepared for use in medicines, pharmacy and otherwise, etc. Directors: E. G. Rees, 101, London Road, Leicester; Mrs. Dorothy E. Rees.

WATSON'S LABORATORIES, LTD. Private company. Registered February 19. Capital, £1,000 in £1 shares. To carry on business as manufacturing and retail chemists, druggists and analysts, producers and sellers of acids, mineral and other waters, etc. Directors: H. B. Watson, 28, St. Albans Road, Watford; W. C. Watson, Garston Farm, Watford; E. B. Barter, 15, Ewell Road.

World Production and Trade in Basic Phosphate Slag

WORLD production of basic phosphate slag in 1928, amounting to over 5,200,000 metric tons, was only slightly higher than the 1927 figure. During this period France displaced Germany as the world's leading producer. Germany is still, however, the largest consumer. The following table compiled from the International Yearbook of Agricultural Statistics, 1928–29, published at Rome, shows the basic phosphate slag production and foreign trade of the principal countries during 1928:—

	Production	Imports	Exports
	Metric Tons	Metric Tons	Metric Tons
Germany	1,416,000	1,160,585	436,098
Austria	—	62,914	5
Belgium	955,625	39,805	121,921
Canada	—	12,683	—
Czechoslovakia	154,932	39,242	16,535
Denmark	—	12,949	—
Finland	—	46,611	—
France	1,475,000	2,418	1,027,682
Great Britain and North Ireland	221,498	68,797	22,650
			2,000
Irish Free State	—	30,782	—
Italy	—	106,569	38
Latvia	—	29,674	183
Luxemburg	607,000	—	—
Norway	—	21,266	7
Netherlands	—	423,126	1,358
Poland	33,100	273,797	85
Sarre	329,983	—	—
Spain	—	13,815	—
Union of South Africa	—	16,307	—
New Zealand	—	93,010	—
Switzerland	—	101,164	—

French Production of Synthetic Methanol Increasing

THE Mines de Bethune, which during the past two years has been producing only 3,000 litres of methanol daily, has now doubled this production and has completed the erection of a plant which will soon triple the present output. This company is also producing 120 tons of formaldehyde monthly and approximately 1,000 litres of ether daily. Apparently the rather uncertain period attendant upon this company's first attempts at synthetic methanol production is ended and the industry definitely established.— U.S.A. Trade Commissioner in Paris.